

MR MARES

1893-94







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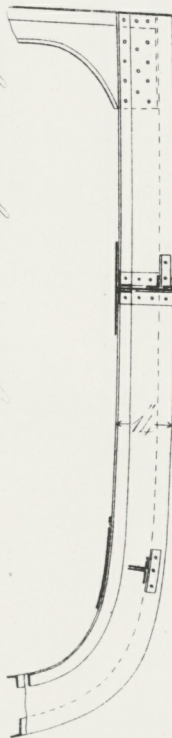




*Sketches illustrating the arrangement of Web-Frames  
and Side Stringers in lieu of Hold-Beams,  
as per Section 14a, paragraphs 9 to 19.*

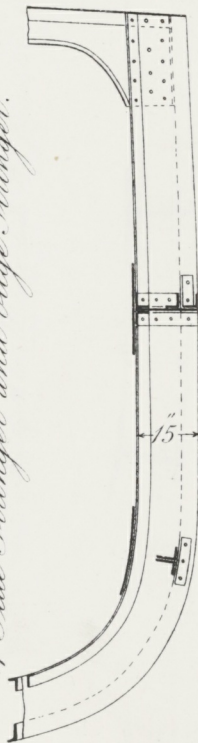
*under 16 feet  
(par 9)*

*14 "Web-frames, 8 frames spaces apart;  
1 Side Stringer and bilge Stringer.*



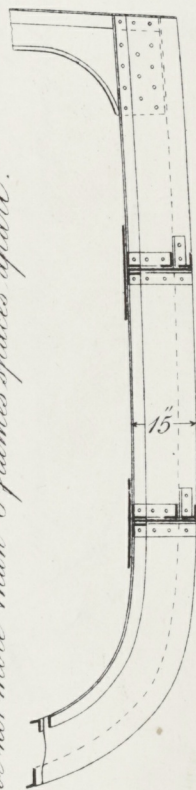
*16 feet  
and under  
17 feet  
(par 10)*

*15 "Web-frames, 8 frames spaces apart;  
1 Side Stringer and bilge Stringer.*



*17 feet  
and under  
18 feet  
(par 11)*

*15 "Web-frames, 8 frames spaces apart and 2 Side Stringers.  
When under 18 feet to the Middle or Lower deck the Web-frames  
to be not more than 6 frames spaces apart.*





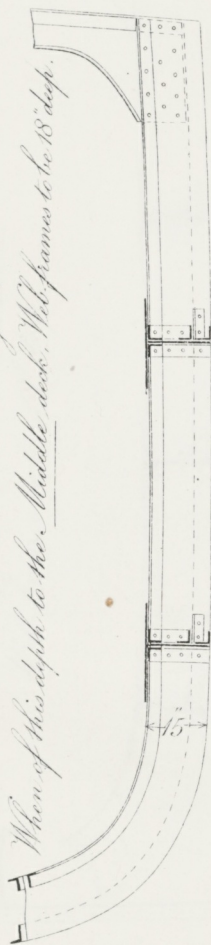




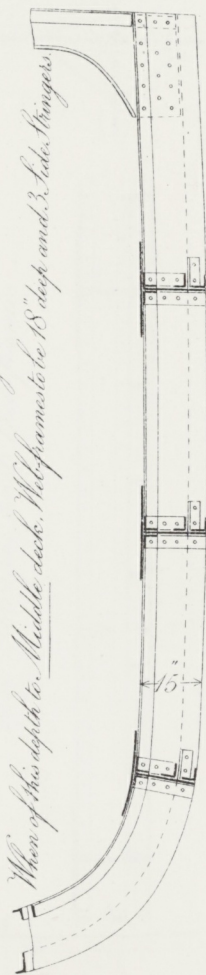
*Web-frames and Side Stringers in lieu of Hold beams. (continued)*

18 feet  
and under  
21½ feet  
(par 12)

15" Web-frames, 6 frame spaces apart  
and 2 Side Stringers.

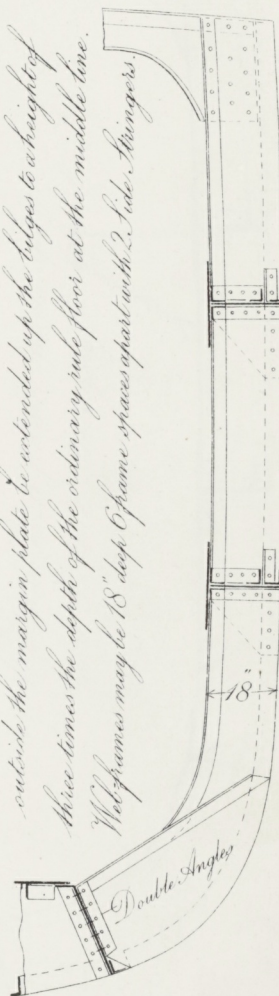


15" Web-frames, 6 frame spaces apart  
and 3 Side Stringers.



21½ feet and under 22½ feet (par 13)

Or. In Vessels fitted with double bottoms, provided the brackets outside the margin plate be extended up the sides to a height of three times the depth of the ordinary rule floor at the middle line. Web-frames may be 18" deep 6 frame spaces apart with 2 Side Stringers.





1870

1871

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

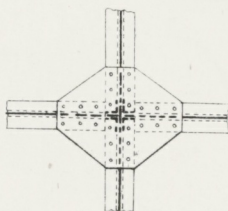


*Web-frames and Side Stringers in lieu of Hold beams. (continued)*

*22½ feet  
and under  
23½ feet  
(par 1½)*

*Diamond Plates.*

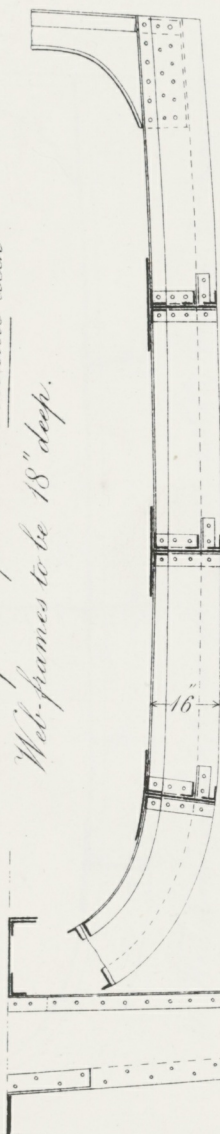
*23½ feet  
and under  
24 feet  
(par 1½)*



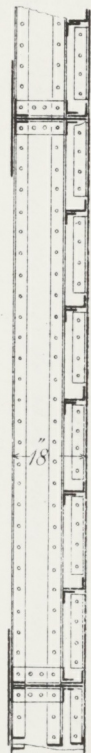
*16" Web-frames, 6 frame spaces apart and 3 Side Stringers.*

*When of this depth to the Middle deck*

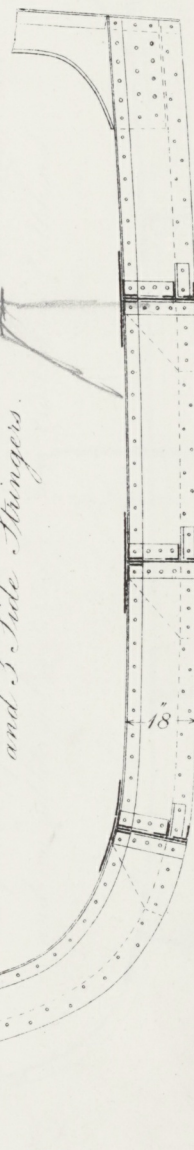
*Web-frames to be 18" deep.*



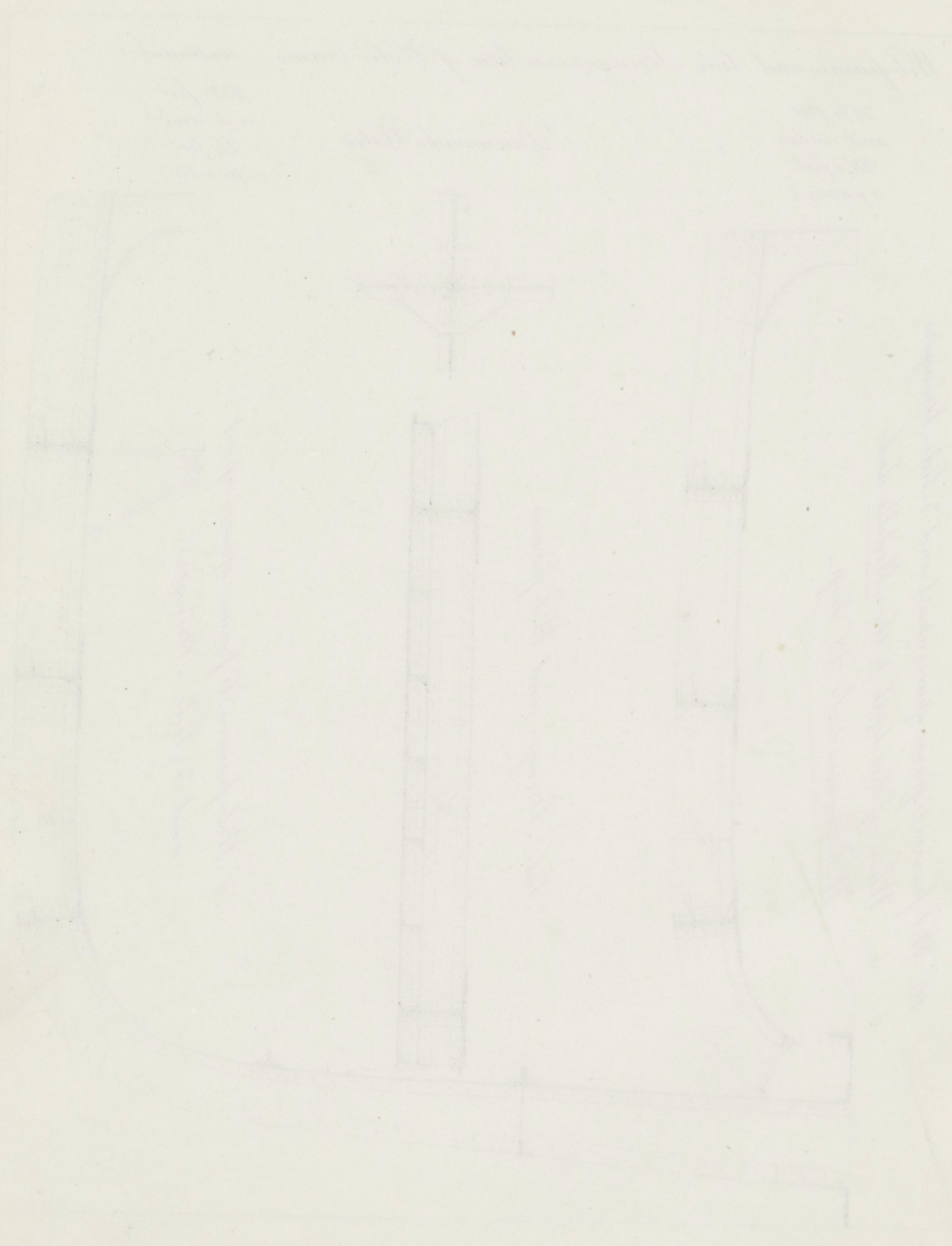
*Side Stringer and Web-frames.*



*18" Web-frames, 6 frame spaces apart  
and 3 Side Stringers.*







Web-frames in way of Raised Quarter Deck in lieu of lower deck beams and beams of extra strength wide spaced in lower hold. (see section 14a paragraphs 16 to 19)

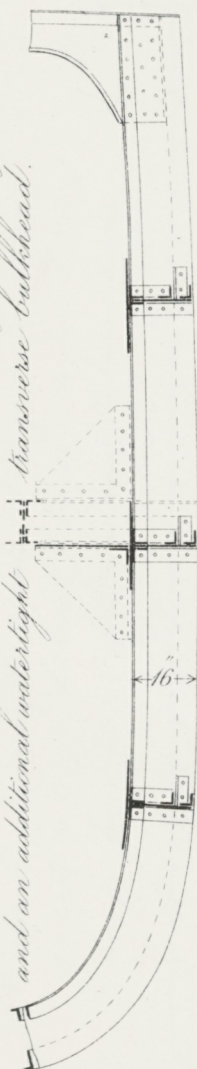
24 feet  
and under  
25 feet  
(par 16)

25 feet  
and under  
26 feet  
(par 17)

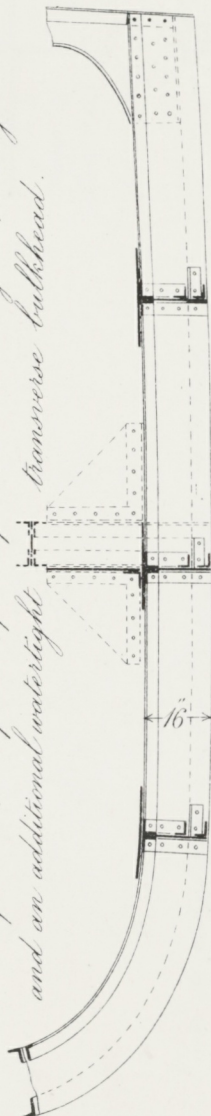
26 feet  
and under  
27 feet  
(par 18)

27 ft. and under 28 ft.  
(par 19)

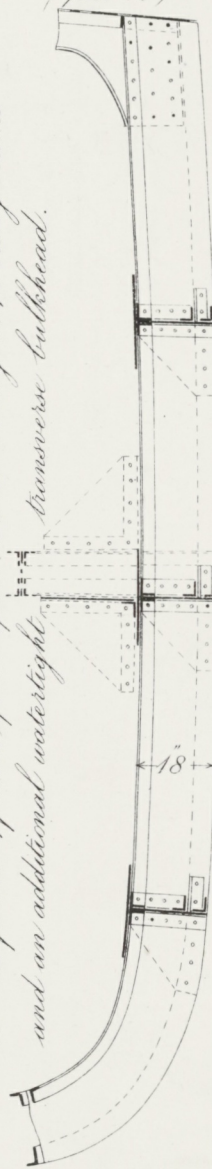
16 "Web-frames, 5 frame spaces apart, 3 Side Stringers, 4 Strong beams and an additional watertight transverse bulkhead.



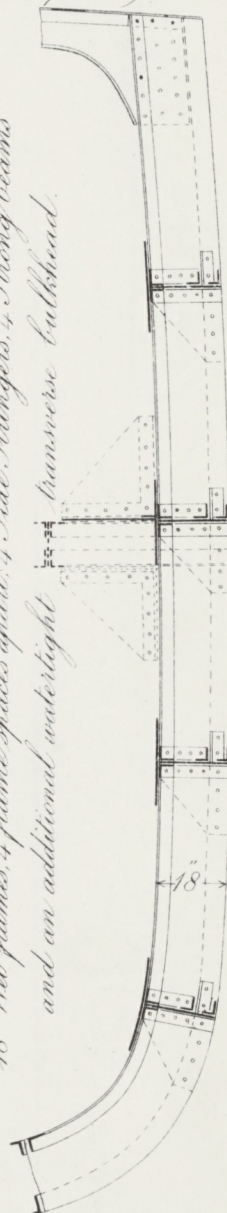
16 "Web-frames, 4 to 5 frame spaces apart, 3 Side Stringers, 4 Strong beams and an additional watertight transverse bulkhead.



18 "Web-frames, 4 frame spaces apart, 3 Side Stringers, 4 Strong beams and an additional watertight transverse bulkhead.



18 "Web-frames, 4 frame spaces apart, 4 Side Stringers, 4 Strong beams and an additional watertight transverse bulkhead.





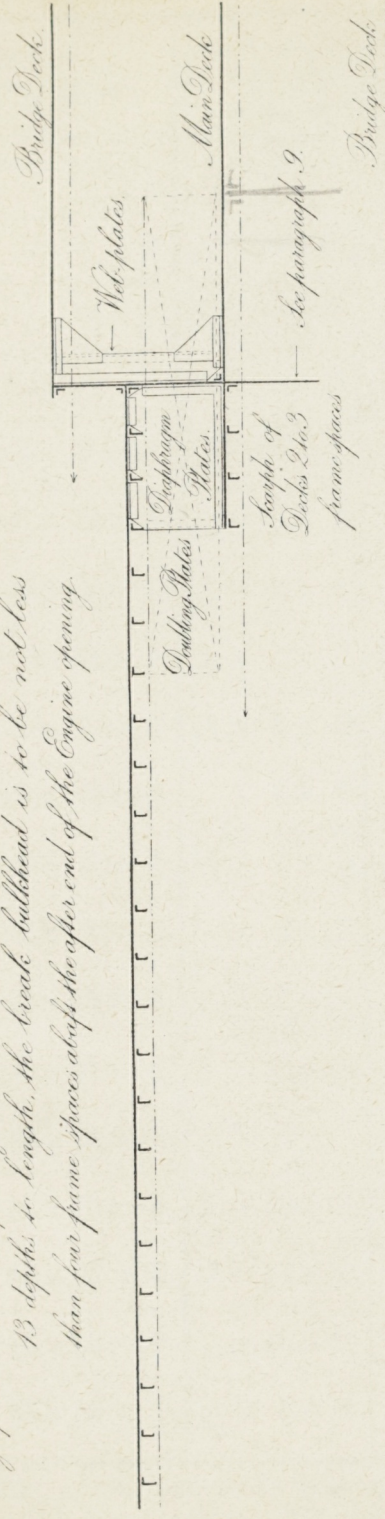


Section 45. Sketches shewing arrangements at Break of Paced Quarter Deck as per paragraphs 5, 6, 7, 8 & 9.

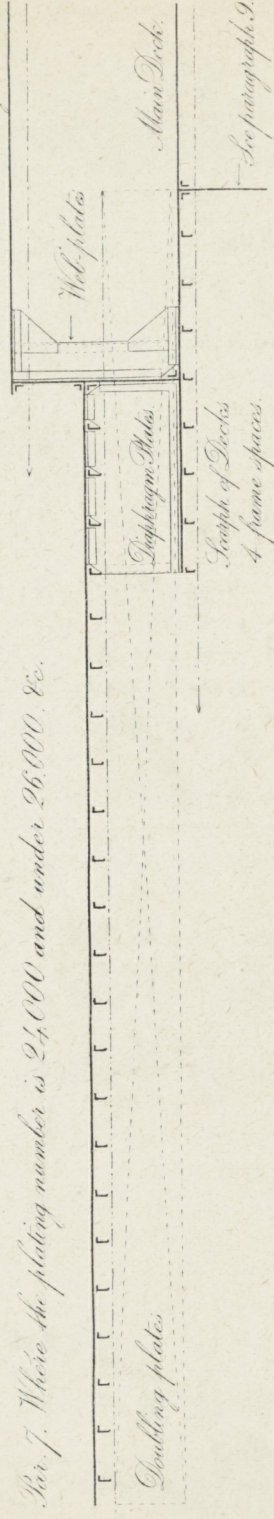
Paragraph 9. Where the playing number exceeds 20,000 or the Vessel is over

43 depths so long, the break bulkhead is to be not less

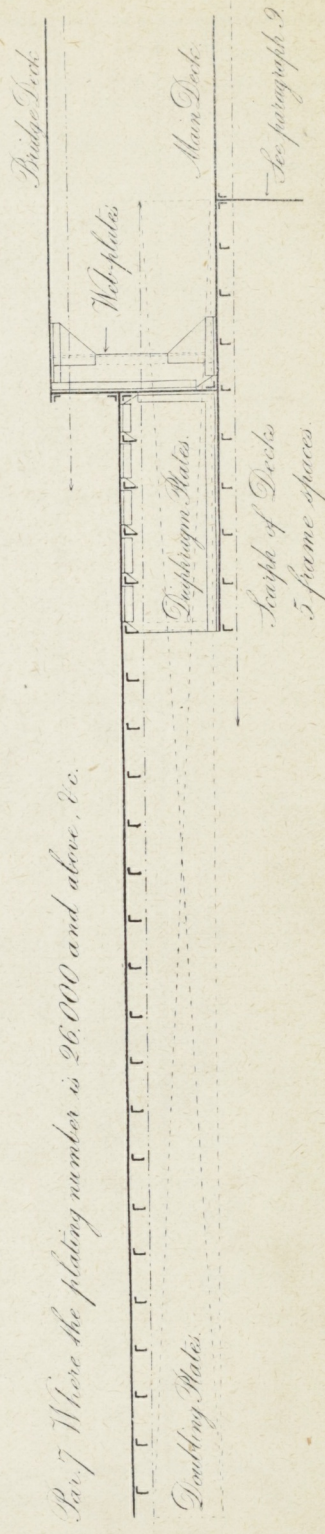
than four frame spaces above the after end of the Engine opening.



Par. 7. Where the plating number is 24,000 and under 26,000, &c.



Par. 7 Where the plating number is 26,000 and above, &c.













# IRON VESSELS.

Table of Minimum Dimensions of FRAMES,

NUMBERS. For Frames, Reversed Frames, Bulkheads, and Pillars. (See Section 2.)	SPACING OF FRAMES.	FRAMES.		Reversed Frames.	Dimensions of  and Channel bar Frames for three-fifths length amidships.	Bulkheads.	
		Dimensions of angles for three- fifths the length of vessel amidships, and bulkheads.	Dimensions of angles before and abaft the three-fifths length.	Dimensions of Reversed angles all fore and aft.		Lower Half.	Upper Half.
	inches.	inches.	inches.	inches.	inches.	inches.	inches.
31.5 and 37 under	20	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{16}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{16}$	$2\frac{1}{4} \times 2\frac{1}{4} \times \frac{4}{16}$	...	$\frac{4}{16}$	$\frac{4}{16}$
37 and 45 under	21	$3 \times 2\frac{1}{2} \times \frac{5}{16}$	$3 \times 2\frac{1}{2} \times \frac{5}{16}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{4}{16}$	...	$\frac{4}{16}$	$\frac{4}{16}$
45 and 52 under	21	$3 \times 3 \times \frac{6}{16}$	$3 \times 3 \times \frac{5}{16}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{16}$	...	$\frac{4}{16}$	$\frac{4}{16}$
52 and 57 under	22	$3\frac{1}{2} \times 3 \times \frac{6}{16}$	$3\frac{1}{2} \times 3 \times \frac{5}{16}$	$3 \times 2\frac{1}{2} \times \frac{5}{16}$	$3\frac{1}{2} \times 3 \times 3 \times \frac{7}{16}$	$\frac{5}{16}$	$\frac{5}{16}$
57 and 61 under	22	$3\frac{1}{2} \times 3 \times \frac{7}{16}$	$3\frac{1}{2} \times 3 \times \frac{6}{16}$	$3 \times 2\frac{1}{2} \times \frac{6}{16}$	$3\frac{1}{2} \times 3 \times 3 \times \frac{8}{16}$	$\frac{5}{16}$	$\frac{5}{16}$
61 and 65 under	23	$4 \times 3 \times \frac{7}{16}$	$4 \times 3 \times \frac{6}{16}$	$3 \times 3 \times \frac{6}{16}$	$4 \times 3 \times 3 \times \frac{8}{16}$	$\frac{6}{16}$	$\frac{5}{16}$
65 and 68 under	23	$4 \times 3 \times \frac{7}{16}$	$4 \times 3 \times \frac{6}{16}$	$3 \times 3 \times \frac{6}{16}$	$4 \times 3 \times 3 \times \frac{8}{16}$	$\frac{6}{16}$	$\frac{5}{16}$
68 and 71 under	23	$4\frac{1}{2} \times 3 \times \frac{7}{16}$	$4\frac{1}{2} \times 3 \times \frac{6}{16}$	$3 \times 3 \times \frac{7}{16}$	$4\frac{1}{2} \times 3 \times 3 \times \frac{8}{16}$	$\frac{6}{16}$	$\frac{5}{16}$
71 and 73 under	24	$4\frac{1}{2} \times 3 \times \frac{8}{16}$	$4\frac{1}{2} \times 3 \times \frac{7}{16}$	$3 \times 3 \times \frac{7}{16}$	$4\frac{1}{2} \times 3 \times 3 \times \frac{9}{16}$	$\frac{6}{16}$	$\frac{5}{16}$
73 and 76 under	24	$5 \times 3 \times \frac{8}{16}$	$5 \times 3 \times \frac{7}{16}$	$3 \times 3 \times \frac{7}{16}$	$5 \times 3 \times 3 \times \frac{9}{16}$	$\frac{6}{16}$	$\frac{5}{16}$
76 and 80 under	24	$5 \times 3 \times \frac{8}{16}$	$5 \times 3 \times \frac{7}{16}$	$3\frac{1}{2} \times 3 \times \frac{8}{16}$	$5 \times 3 \times 3 \times \frac{10}{16}$	$\frac{7}{16}$	$\frac{6}{16}$
80 and 85 under	24	$5 \times 3\frac{1}{2} \times \frac{8}{16}$	$5 \times 3\frac{1}{2} \times \frac{7}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{16}$	$5 \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{10}{16}$	$\frac{7}{16}$	$\frac{6}{16}$
85 and 92 under	24	$5\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{16}$	$5\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{16}$	$5\frac{1}{2} \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{10}{16}$	$\frac{7}{16}$	$\frac{6}{16}$
92 and 99 under	24	$5\frac{1}{2} \times 3\frac{1}{2} \times \frac{9}{16}$	$5\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{16}$	$4 \times 3\frac{1}{2} \times \frac{8}{16}$	$5\frac{1}{2} \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{11}{16}$	$\frac{7}{16}$	$\frac{6}{16}$
99 and 104 under	25	$6 \times 3\frac{1}{2} \times \frac{9}{16}$	$6 \times 3\frac{1}{2} \times \frac{8}{16}$	$4 \times 3\frac{1}{2} \times \frac{9}{16}$	$6 \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{11}{16}$	$\frac{7}{16}$	$\frac{6}{16}$
104 and 110 under	25	$6 \times 3\frac{1}{2} \times \frac{10}{16}$	$6 \times 3\frac{1}{2} \times \frac{9}{16}$	$4\frac{1}{2} \times 3\frac{1}{2} \times \frac{9}{16}$	$6 \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{12}{16}$	$\frac{7}{16}$	$\frac{6}{16}$
110 and 115 under	26	$6\frac{1}{2} \times 3\frac{1}{2} \times \frac{10}{16}$	$6\frac{1}{2} \times 3\frac{1}{2} \times \frac{9}{16}$	$4\frac{1}{2} \times 3\frac{1}{2} \times \frac{9}{16}$	$6\frac{1}{2} \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{12}{16}$	$\frac{7}{16}$	$\frac{6}{16}$
115 and 120 under	26	$7 \times 3\frac{1}{2} \times \frac{10}{16}$	$6\frac{1}{2} \times 3\frac{1}{2} \times \frac{9}{16}$	$4\frac{1}{2} \times 4 \times \frac{9}{16}$	$7 \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{12}{16}$	$\frac{7}{16}$	$\frac{6}{16}$

MEMO.:—Wider spacing than the above may be adopted, provided the

The thickness given for Channel or  Sections is to



# REVERSED FRAMES, FLOOR PLATES, BULKHEADS, PILLARS, &c. TABLE G 1.

Diameter of Solid pillars, and diameter and thickness of hollow malleable pillars to beams.				TABLE FOR SIZES OF FLOORS.									
Solid Pillars.		Hollow malleable Pillars.		Floor plates in engine and boiler space of steam vessels to be $\frac{1}{16}$ of an inch thicker than given in this table, where the plates are $\frac{1}{16}$ of an inch and under.									
Hold.	Tween dk. poop, bridge, and forecastle.	Hold.	Tween deck poop, bridge, and forecastle.	NUMBERS FOR FLOORS. (See Section 2.)			For three-fifths length amidships.	Thick-ness at Ends.	NUMBERS FOR FLOORS.—(continued.) (See Section 2.)			For three-fifths length amidships.	Thick-ness at Ends.
inches.	inches.	inches.	inches.				inches.	inches.				inches.	inches.
...	$2\frac{1}{4}$	...	$3 \times \frac{5}{16}$	31 and under	32		$9 \times \frac{4}{16}$	$\frac{4}{16}$	66 and under	67		$20 \times \frac{8}{16}$	$\frac{7}{16}$
...	$2\frac{1}{2}$	...	$3\frac{1}{4} \times \frac{5}{16}$	32 and under	33		$9\frac{1}{2} \times \frac{4}{16}$	$\frac{4}{16}$	67 and under	68		$20\frac{1}{2} \times \frac{8}{16}$	$\frac{7}{16}$
$2\frac{1}{2}$	$2\frac{3}{8}$	$3\frac{1}{4} \times \frac{6}{16}$	$3\frac{1}{4} \times \frac{5}{16}$	33 and under	34		$10 \times \frac{4}{16}$	$\frac{4}{16}$	68 and under	69		$21 \times \frac{8}{16}$	$\frac{7}{16}$
$2\frac{5}{8}$	$2\frac{3}{8}$	$3\frac{1}{2} \times \frac{6}{16}$	$3\frac{1}{4} \times \frac{5}{16}$	34 and under	35		$10\frac{1}{2} \times \frac{4}{16}$	$\frac{4}{16}$	69 and under	70		$21 \times \frac{9}{16}$	$\frac{7}{16}$
$2\frac{3}{4}$	$2\frac{1}{2}$	$3\frac{3}{4} \times \frac{6}{16}$	$3\frac{1}{4} \times \frac{6}{16}$	35 and under	37		$11 \times \frac{5}{16}$	$\frac{5}{16}$	70 and under	71		$21\frac{1}{2} \times \frac{9}{16}$	$\frac{7}{16}$
$2\frac{7}{8}$	$2\frac{1}{2}$	$3\frac{7}{8} \times \frac{6}{16}$	$3\frac{1}{4} \times \frac{6}{16}$	37 and under	39		$11\frac{1}{2} \times \frac{5}{16}$	$\frac{5}{16}$	71 and under	72		$22 \times \frac{9}{16}$	$\frac{7}{16}$
3	$2\frac{1}{2}$	$4 \times \frac{6}{16}$	$3\frac{1}{4} \times \frac{6}{16}$	39 and under	41		$12 \times \frac{5}{16}$	$\frac{5}{16}$	72 and under	73		$22\frac{1}{2} \times \frac{9}{16}$	$\frac{7}{16}$
$3\frac{1}{8}$	$2\frac{5}{8}$	$4 \times \frac{7}{16}$	$3\frac{1}{2} \times \frac{6}{16}$	41 and under	43		$12 \times \frac{6}{16}$	$\frac{5}{16}$	73 and under	74		$23 \times \frac{9}{16}$	$\frac{7}{16}$
$3\frac{1}{4}$	$2\frac{5}{8}$	$4\frac{1}{8} \times \frac{7}{16}$	$3\frac{1}{2} \times \frac{6}{16}$	43 and under	45		$12\frac{1}{2} \times \frac{6}{16}$	$\frac{5}{16}$	74 and under	76		$23\frac{1}{2} \times \frac{9}{16}$	$\frac{7}{16}$
$3\frac{3}{8}$	$2\frac{5}{8}$	$4\frac{1}{4} \times \frac{7}{16}$	$3\frac{1}{2} \times \frac{6}{16}$	45 and under	47		$13 \times \frac{6}{16}$	$\frac{5}{16}$	76 and under	78		$24 \times \frac{9}{16}$	$\frac{7}{16}$
$3\frac{1}{2}$	$2\frac{3}{4}$	$4\frac{1}{2} \times \frac{7}{16}$	$3\frac{3}{4} \times \frac{6}{16}$	47 and under	49		$13\frac{1}{2} \times \frac{6}{16}$	$\frac{5}{16}$	78 and under	80		$24 \times \frac{10}{16}$	$\frac{8}{16}$
$3\frac{5}{8}$	$2\frac{3}{4}$	$4\frac{3}{4} \times \frac{7}{16}$	$3\frac{3}{4} \times \frac{6}{16}$	49 and under	51		$14 \times \frac{6}{16}$	$\frac{5}{16}$	80 and under	84		$24\frac{1}{2} \times \frac{10}{16}$	$\frac{8}{16}$
$3\frac{5}{8}$	$2\frac{3}{4}$	$4\frac{3}{4} \times \frac{7}{16}$	$3\frac{3}{4} \times \frac{6}{16}$	51 and under	52		$14\frac{1}{2} \times \frac{6}{16}$	$\frac{5}{16}$	84 and under	88		$25 \times \frac{10}{16}$	$\frac{8}{16}$
$3\frac{3}{4}$	$2\frac{7}{8}$	$5 \times \frac{7}{16}$	$3\frac{7}{8} \times \frac{6}{16}$	52 and under	53		$15 \times \frac{6}{16}$	$\frac{5}{16}$	88 and under	90		$26 \times \frac{10}{16}$	$\frac{8}{16}$
4	3	$5\frac{1}{2} \times \frac{7}{16}$	$4 \times \frac{6}{16}$	53 and under	55		$15\frac{1}{2} \times \frac{6}{16}$	$\frac{5}{16}$	90 and under	92		$27 \times \frac{10}{16}$	$\frac{8}{16}$
$4\frac{1}{4}$	3	$5\frac{3}{4} \times \frac{7}{16}$	$4 \times \frac{6}{16}$	55 and under	56		$15\frac{1}{2} \times \frac{7}{16}$	$\frac{6}{16}$	92 and under	95		$28 \times \frac{10}{16}$	$\frac{8}{16}$
$4\frac{1}{2}$	$3\frac{1}{4}$	$6 \times \frac{7}{16}$	$4\frac{1}{8} \times \frac{7}{16}$	56 and under	57		$16 \times \frac{7}{16}$	$\frac{6}{16}$	95 and under	98		$29 \times \frac{10}{16}$	$\frac{8}{16}$
				57 and under	58		$16\frac{1}{2} \times \frac{7}{16}$	$\frac{6}{16}$	98 and under	101		$30 \times \frac{10}{16}$	$\frac{8}{16}$
				58 and under	59		$17 \times \frac{7}{16}$	$\frac{6}{16}$	101 and under	105		$31 \times \frac{10}{16}$	$\frac{8}{16}$
				59 and under	60		$17\frac{1}{2} \times \frac{7}{16}$	$\frac{6}{16}$	105 and under	108		$32 \times \frac{10}{16}$	$\frac{8}{16}$
				60 and under	62		$17\frac{1}{2} \times \frac{8}{16}$	$\frac{7}{16}$	108 and under	110		$33 \times \frac{10}{16}$	$\frac{8}{16}$
				62 and under	63		$18 \times \frac{8}{16}$	$\frac{7}{16}$	110 and under	113		$34 \times \frac{10}{16}$	$\frac{8}{16}$
				63 and under	64		$18\frac{1}{2} \times \frac{8}{16}$	$\frac{7}{16}$	113 and under	116		$35 \times \frac{10}{16}$	$\frac{8}{16}$
				64 and under	65		$19 \times \frac{8}{16}$	$\frac{7}{16}$	116 and under	120		$36 \times \frac{10}{16}$	$\frac{8}{16}$
				65 and under	66		$19\frac{1}{2} \times \frac{8}{16}$	$\frac{7}{16}$					

framing and plating be increased in size to the satisfaction of the Committee.  
 be the minimum thickness of both webs and flanges.









# IRON VESSELS.

Table of Minimum Dimensions of KEELS,

NUMBERS. For Keel, Stem, Sternpost, and Plating. (See Section 2.)	Bar Keels for all Grades.	Stem or Sailing vessels and Steamers, and Sternposts of Sailing vessels and Paddle Steamers.	Stern frames of Screw Steamers.	THICKNESS					
				Flat Plate Keels for all grades, breadth and thickness.		Garboard Strakes, breadth and thickness.			
				Three-fifths length amidships.	Ends.	100A		90A & 80A	
						Half length amidships.	Ends.	Half length amidships.	Ends.
	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.
2600 and under 3400	$6 \times 1\frac{1}{8}$	$5\frac{1}{2} \times 1\frac{1}{8}$	$5\frac{1}{2} \times 2\frac{1}{4}$	$30 \times \frac{8}{16}$	$\frac{6}{16}$	$30 \times \frac{6}{16}$	$\frac{6}{16}$	$30 \times \frac{6}{16}$	$\frac{6}{16}$
3400 and under 5200	$6\frac{3}{4} \times 1\frac{1}{4}$	$6 \times 1\frac{1}{4}$	$6 \times 2\frac{1}{2}$	$30 \times \frac{9}{16}$	$\frac{7}{16}$	$30 \times \frac{7}{16}$	$\frac{7}{16}$	$30 \times \frac{6}{16}$	$\frac{6}{16}$
5200 and under 7200	$7 \times 1\frac{5}{8}$	$6\frac{1}{4} \times 1\frac{5}{8}$	$6\frac{1}{4} \times 3\frac{1}{4}$	$30 \times \frac{10}{16}$	$\frac{8}{16}$	$30 \times \frac{8}{16}$	$\frac{8}{16}$	$30 \times \frac{7}{16}$	$\frac{7}{16}$
7200 and under 8900	$7\frac{1}{4} \times 1\frac{7}{8}$	$6\frac{1}{2} \times 1\frac{7}{8}$	$6\frac{1}{2} \times 3\frac{3}{4}$	$30 \times \frac{11}{16}$	$\frac{9}{16}$	$30 \times \frac{9}{16}$	$\frac{8}{16}$	$30 \times \frac{8}{16}$	$\frac{8}{16}$
8900 and under 10450	$7\frac{1}{2} \times 2\frac{1}{8}$	$6\frac{3}{4} \times 2\frac{1}{8}$	$6\frac{3}{4} \times 4\frac{1}{4}$	$32 \times \frac{12}{16}$	$\frac{9}{16}$	$32 \times \frac{9}{16}$	$\frac{8}{16}$	$32 \times \frac{8}{16}$	$\frac{8}{16}$
10450 and under 11800	$7\frac{1}{2} \times 2\frac{1}{4}$	$7 \times 2\frac{1}{4}$	$7 \times 4\frac{1}{2}$	$32 \times \frac{12}{16}$	$\frac{9}{16}$	$32 \times \frac{9}{16}$	$\frac{8}{16}$	$32 \times \frac{8}{16}$	$\frac{8}{16}$
11800 and under 13100	$8 \times 2\frac{3}{8}$	$7 \times 2\frac{3}{8}$	$7 \times 4\frac{3}{4}$	$32 \times \frac{13}{16}$	$\frac{10}{16}$	$32 \times \frac{10}{16}$	$\frac{9}{16}$	$32 \times \frac{9}{16}$	$\frac{8}{16}$
13100 and under 14300	$8 \times 2\frac{3}{8}$	$7\frac{1}{4} \times 2\frac{3}{8}$	$7\frac{1}{4} \times 4\frac{3}{4}$	$34 \times \frac{13}{16}$	$\frac{10}{16}$	$34 \times \frac{10}{16}$	$\frac{9}{16}$	$34 \times \frac{9}{16}$	$\frac{8}{16}$
14300 and under 15500	$8 \times 2\frac{3}{8}$	$7\frac{1}{2} \times 2\frac{3}{8}$	$7\frac{1}{2} \times 4\frac{3}{4}$	$34 \times \frac{14}{16}$	$\frac{11}{16}$	$34 \times \frac{11}{16}$	$\frac{10}{16}$	$34 \times \frac{10}{16}$	$\frac{9}{16}$
15500 and under 16600	$8\frac{1}{2} \times 2\frac{1}{2}$	$8 \times 2\frac{1}{2}$	$8 \times 5$	$34 \times \frac{14}{16}$	$\frac{11}{16}$	$34 \times \frac{11}{16}$	$\frac{10}{16}$	$34 \times \frac{10}{16}$	$\frac{9}{16}$
16600 and under 18700	$9 \times 2\frac{1}{2}$	$8\frac{1}{2} \times 2\frac{1}{2}$	$8\frac{1}{2} \times 5$	$36 \times \frac{15}{16}$	$\frac{11}{16}$	$36 \times \frac{11}{16}$	$\frac{10}{16}$	$36 \times \frac{10}{16}$	$\frac{9}{16}$
18700 and under 21700	$9\frac{1}{2} \times 2\frac{1}{2}$	$9 \times 2\frac{1}{2}$	$9 \times 5\frac{1}{2}$	$36 \times \frac{16}{16}$	$\frac{12}{16}$	$36 \times \frac{12}{16}$	$\frac{11}{16}$	$36 \times \frac{11}{16}$	$\frac{10}{16}$
21700 and under 26400	$10 \times 2\frac{3}{4}$	$10 \times 2\frac{3}{4}$	$10 \times 6$	$36 \times \frac{16}{16}$	$\frac{12}{16}$	$36 \times \frac{12}{16}$	$\frac{11}{16}$	$36 \times \frac{11}{16}$	$\frac{10}{16}$
26400 and under 30900	$11 \times 2\frac{3}{4}$	$11 \times 2\frac{3}{4}$	$11 \times 6\frac{1}{2}$	$36 \times \frac{16}{16}$	$\frac{12}{16}$	$36 \times \frac{12}{16}$	$\frac{11}{16}$	$36 \times \frac{12}{16}$	$\frac{11}{16}$
30900 and under 35200	$11 \times 3$	$11 \times 3$	$11 \times 7$	$36 \times \frac{17}{16}$	$\frac{13}{16}$	$36 \times \frac{13}{16}$	$\frac{12}{16}$	$36 \times \frac{12}{16}$	$\frac{11}{16}$
35200 and under 40000	$11 \times 3\frac{1}{4}$	$11 \times 3\frac{1}{4}$	$11 \times 7\frac{1}{2}$	$36 \times \frac{18}{16}$	$\frac{14}{16}$	$36 \times \frac{14}{16}$	$\frac{13}{16}$	$36 \times \frac{12}{16}$	$\frac{11}{16}$
40000 and under 48500	$12 \times 3\frac{1}{4}$	$12 \times 3\frac{1}{4}$	$12 \times 8$	$36 \times \frac{19}{16}$	$\frac{14}{16}$	$36 \times \frac{14}{16}$	$\frac{13}{16}$	—	—
48500 and under 56000	$12 \times 3\frac{1}{2}$	$12 \times 3\frac{1}{2}$	$13 \times 8\frac{1}{2}$	$36 \times \frac{20}{16}$	$\frac{15}{16}$	$36 \times \frac{15}{16}$	$\frac{14}{16}$	—	—
56000 and under 67000	$12 \times 3\frac{3}{4}$	$12 \times 3\frac{3}{4}$	$13 \times 9$	$36 \times \frac{20}{16}$	$\frac{15}{16}$	$36 \times \frac{15}{16}$	$\frac{14}{16}$	—	—

MEM.—The Scantlings given in the above Table are intended for Vessels the length of which does not exceed *eleven times* their depth from top of keel, see Section 1. For Vessels which exceed this proportion, See Section 46, and Table G 6. For proportions of breadth to length, see Table G 5.



TABLE G 2.

STEMS, STERN POSTS, AND OUTSIDE PLATING.

## OF OUTSIDE PLATING.

From Gar-board to the lower edge or Sheerstrake.*						Sheerstrakes for all grades, breadth, and thickness.		From main to upper Sheerstrake in Spar-decked vessels.		Spar deck Sheerstrake, breadth and thickness.		Awning deck and Bridge Side Plating, also Poops and Fore-castles.
100A		90A		80A		Half length amidships.	Ends.	Half length amidships.	Ends.	Half length amidships.	Ends.	
inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.
$\frac{5}{16} \& \frac{6}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{4}{16} \& \frac{5}{16}$	$\frac{4}{16} \& \frac{5}{16}$	$30 \times \frac{6}{16}$	$\frac{5}{16}$	—	—	—	—	—
$\frac{6}{16}$	$\frac{5}{16}$	$\frac{5}{16} \& \frac{6}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$30 \times \frac{7}{16}$	$\frac{6}{16}$	—	—	—	—	—
$\frac{6}{16} \& \frac{7}{16}$	$\frac{5}{16} \& \frac{6}{16}$	$\frac{6}{16}$	$\frac{5}{16}$	$\frac{5}{16} \& \frac{6}{16}$	$\frac{5}{16}$	$30 \times \frac{8}{16}$	$\frac{7}{16}$	—	—	—	—	—
$\frac{7}{16}$	$\frac{6}{16}$	$\frac{6}{16} \& \frac{7}{16}$	$\frac{5}{16} \& \frac{6}{16}$	$\frac{6}{16}$	$\frac{5}{16}$	$33 \times \frac{9}{16}$	$\frac{8}{16}$	—	—	—	—	—
$\frac{7}{16} \& \frac{8}{16}$	$\frac{6}{16} \& \frac{7}{16}$	$\frac{7}{16}$	$\frac{6}{16}$	$\frac{6}{16} \& \frac{7}{16}$	$\frac{5}{16} \& \frac{6}{16}$	$33 \times \frac{10}{16}$	$\frac{8}{16}$	—	—	—	—	$\frac{5}{16}$
$\frac{8}{16}$	$\frac{7}{16}$	$\frac{7}{16} \& \frac{8}{16}$	$\frac{6}{16} \& \frac{7}{16}$	$\frac{7}{16}$	$\frac{6}{16}$	$33 \times \frac{10}{16}$	$\frac{8}{16}$	—	—	—	—	$\frac{5}{16}$
$\frac{8}{16} \& \frac{9}{16}$	$\frac{7}{16} \& \frac{8}{16}$	$\frac{8}{16}$	$\frac{7}{16}$	$\frac{7}{16} \& \frac{8}{16}$	$\frac{6}{16} \& \frac{7}{16}$	$36 \times \frac{10}{16}$	$\frac{8}{16}$	—	—	—	—	$\frac{5}{16}$
$\frac{9}{16}$	$\frac{8}{16}$	$\frac{8}{16} \& \frac{9}{16}$	$\frac{7}{16} \& \frac{8}{16}$	$\frac{8}{16}$	$\frac{7}{16}$	$36 \times \frac{11}{16}$	$\frac{9}{16}$	$\frac{7}{16}$	$\frac{6}{16}$	$36 \times \frac{9}{16}$	$\frac{8}{16}$	$\frac{6}{16}$
$\frac{9}{16} \& \frac{10}{16}$	$\frac{8}{16}$	$\frac{9}{16}$	$\frac{8}{16}$	$\frac{8}{16} \& \frac{9}{16}$	$\frac{7}{16} \& \frac{8}{16}$	$36 \times \frac{11}{16}$	$\frac{9}{16}$	$\frac{7}{16}$	$\frac{6}{16}$	$36 \times \frac{9}{16}$	$\frac{8}{16}$	$\frac{6}{16}$
$\frac{9}{16} \& \frac{10}{16}$	$\frac{8}{16}$	$\frac{9}{16}$	$\frac{8}{16}$	$\frac{8}{16} \& \frac{9}{16}$	$\frac{8}{16}$	$36 \times \frac{12}{16}$	$\frac{9}{16}$	$\frac{7}{16}$	$\frac{6}{16}$	$36 \times \frac{10}{16}$	$\frac{8}{16}$	$\frac{6}{16}$
$\frac{10}{16}$	$\frac{8}{16}$	$\frac{9}{16} \& \frac{10}{16}$	$\frac{8}{16}$	$\frac{9}{16}$	$\frac{8}{16}$	$40 \times \frac{12}{16}$	$\frac{9}{16}$	$\frac{8}{16}$	$\frac{7}{16}$	$40 \times \frac{10}{16}$	$\frac{8}{16}$	$\frac{6}{16}$
$\frac{10}{16} \& \frac{11}{16}$	$\frac{8}{16} \& \frac{9}{16}$	$\frac{10}{16}$	$\frac{8}{16}$	$\frac{9}{16} \& \frac{10}{16}$	$\frac{8}{16}$	$40 \times \frac{13}{16}$	$\frac{10}{16}$	$\frac{8}{16}$	$\frac{7}{16}$	$40 \times \frac{11}{16}$	$\frac{9}{16}$	$\frac{7}{16}$
$\frac{11}{16}$	$\frac{9}{16}$	—	—	—	—	$40 \times \frac{13}{16}$	$\frac{10}{16}$	$\frac{8}{16}$	$\frac{7}{16}$	$40 \times \frac{11}{16}$	$\frac{9}{16}$	$\frac{7}{16}$
$\frac{11}{16} \& \frac{12}{16}$	$\frac{9}{16}$	—	—	—	—	$40 \times \frac{13}{16}$	$\frac{10}{16}$	$\frac{8}{16}$	$\frac{7}{16}$	$40 \times \frac{11}{16}$	$\frac{9}{16}$	$\frac{7}{16}$
$\frac{12}{16}$	$\frac{9}{16}$	—	—	—	—	$44 \times \frac{13}{16}$	$\frac{10}{16}$	$\frac{9}{16}$	$\frac{8}{16}$	$44 \times \frac{11}{16}$	$\frac{9}{16}$	$\frac{7}{16}$
$\frac{12}{16} \& \frac{13}{16}$	$\frac{9}{16} \& \frac{10}{16}$	—	—	—	—	$44 \times \frac{14}{16}$	$\frac{11}{16}$	$\frac{9}{16}$	$\frac{8}{16}$	$44 \times \frac{12}{16}$	$\frac{9}{16}$	$\frac{7}{16}$
$\frac{13}{16}$	$\frac{10}{16}$	—	—	—	—	$44 \times \frac{14}{16}$	$\frac{11}{16}$	$\frac{9}{16}$	$\frac{8}{16}$	$44 \times \frac{12}{16}$	$\frac{9}{16}$	$\frac{7}{16}$
$\frac{13}{16} \& \frac{14}{16}$	$\frac{10}{16} \& \frac{11}{16}$	—	—	—	—	$46 \times \frac{15}{16}$	$\frac{12}{16}$	$\frac{9}{16}$	$\frac{8}{16}$	$46 \times \frac{13}{16}$	$\frac{10}{16}$	$\frac{7}{16}$
$\frac{14}{16}$	$\frac{11}{16}$	—	—	—	—	$46 \times \frac{16}{16}$	$\frac{13}{16}$	$\frac{9}{16}$	$\frac{8}{16}$	$46 \times \frac{14}{16}$	$\frac{11}{16}$	$\frac{7}{16}$

\* In the columns for plating, where two thicknesses are given they are to be worked in alternate strakes, and the larger thickness is to apply to the outer strakes, and the smaller one to the inner strakes; and the size of the rivets and double riveting to be regulated by the thickness of the thicker plating.









# IRON VESSELS.

Table of Minimum Dimensions of KEELSONS, KEELSON AND

NUMBERS. To regulate keelsons stringers, decks, rudders, ceiling, and windlasses.  (See Section 2.)	Size of middle-line keelsons standing upon floors, and thickness of rider plate to keelson, for all grades.		Thickness of Inter- costal keelson plates.	Dimensions of angle bars for keelsons, and stringers in hold, for all grades.	Dimensions of angle bar on the middle, lower or hold, and orlop beam stringer plates on upper deck stringer plates in spar-decked, and awning-decked vessels.	Dimensions of angle bars on upper deck stringer plates.	RUDDER.	
	Half length amidships.	Thick- ness at ends.					Sailing Vessels.	
	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.
2600 and 3400 under	$7\frac{1}{2} \times \frac{6}{16}$	$\frac{5}{16}$	$\frac{4}{16}$	$3 \times 3 \times \frac{6}{16}$	$2\frac{3}{4} \times 2\frac{3}{4} \times \frac{6}{16}$	$3 \times 3 \times \frac{6}{16}$	$2\frac{7}{8}$	2
3400 and 5200 under	$8\frac{1}{2} \times \frac{7}{16}$	$\frac{6}{16}$	$\frac{5}{16}$	$3 \times 3 \times \frac{6}{16}$	$3 \times 3 \times \frac{6}{16}$	$3 \times 3 \times \frac{6}{16}$	3	2
5200 and 7200 under	$10 \times \frac{8}{16}$	$\frac{7}{16}$	$\frac{5}{16}$	$3 \times 3 \times \frac{6}{16}$	$3 \times 3 \times \frac{6}{16}$	$3 \times 3 \times \frac{6}{16}$	$3\frac{1}{2}$	2
7200 and 8900 under	$11 \times \frac{9}{16}$	$\frac{7}{16}$	$\frac{6}{16}$	$3\frac{1}{2} \times 3 \times \frac{6}{16}$	$3 \times 3 \times \frac{6}{16}$	$3 \times 3 \times \frac{7}{16}$	$3\frac{3}{4}$	$2\frac{1}{4}$
8900 and 10450 under	$12 \times \frac{9}{16}$	$\frac{7}{16}$	$\frac{6}{16}$	$4 \times 3 \times \frac{6}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{6}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	$4\frac{1}{4}$	$2\frac{1}{2}$
10450 and 11800 under	$12 \times \frac{10}{16}$	$\frac{8}{16}$	$\frac{7}{16}$	$4\frac{1}{2} \times 3 \times \frac{7}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	$4\frac{1}{2}$	$2\frac{3}{4}$
11800 and 13100 under	$13 \times \frac{10}{16}$	$\frac{8}{16}$	$\frac{7}{16}$	$4\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	$4 \times 4 \times \frac{7}{16}$	$4\frac{3}{4}$	$2\frac{3}{4}$
13100 and 14300 under	$14 \times \frac{11}{16}$	$\frac{9}{16}$	$\frac{7}{16}$	$5 \times 3\frac{1}{2} \times \frac{7}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{16}$	$4 \times 4 \times \frac{8}{16}$	5	3
14300 and 15500 under	$15 \times \frac{11}{16}$	$\frac{9}{16}$	$\frac{7}{16}$	$5 \times 3\frac{1}{2} \times \frac{8}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{16}$	$4 \times 4 \times \frac{8}{16}$	$5\frac{1}{4}$	3
15500 and 16600 under	$16 \times \frac{12}{16}$	$\frac{10}{16}$	$\frac{8}{16}$	$5 \times 3\frac{1}{2} \times \frac{9}{16}$	$4 \times 4 \times \frac{8}{16}$	$4\frac{1}{2} \times 4\frac{1}{2} \times \frac{9}{16}$	$5\frac{1}{2}$	3
16600 and 18700 under	$17 \times \frac{12}{16}$	$\frac{10}{16}$	$\frac{8}{16}$	$5 \times 4 \times \frac{9}{16}$	$4 \times 4 \times \frac{9}{16}$	$4\frac{1}{2} \times 4\frac{1}{2} \times \frac{9}{16}$	6	3
18700 and 21700 under	$18 \times \frac{13}{16}$	$\frac{11}{16}$	$\frac{8}{16}$	$5\frac{1}{2} \times 4 \times \frac{9}{16}$	$4 \times 4 \times \frac{9}{16}$	$4\frac{1}{2} \times 4\frac{1}{2} \times \frac{9}{16}$	$6\frac{1}{4}$	$3\frac{1}{4}$
21700 and 26400 under	$19 \times \frac{13}{16}$	$\frac{11}{16}$	$\frac{9}{16}$	$6 \times 4 \times \frac{9}{16}$	$4 \times 4 \times \frac{9}{16}$	$4\frac{1}{2} \times 4\frac{1}{2} \times \frac{10}{16}$	$6\frac{3}{4}$	$3\frac{1}{2}$
26400 and 30900 under	$21 \times \frac{14}{16}$	$\frac{12}{16}$	$\frac{9}{16}$	$6\frac{1}{2} \times 4 \times \frac{9}{16}$	$4 \times 4 \times \frac{9}{16}$	$4\frac{1}{2} \times 4\frac{1}{2} \times \frac{10}{16}$	$7\frac{1}{2}$	$3\frac{3}{4}$
30900 and 35200 under	$23 \times \frac{14}{16}$	$\frac{12}{16}$	$\frac{9}{16}$	$6\frac{1}{2} \times 4\frac{1}{2} \times \frac{9}{16}$	$4 \times 4 \times \frac{9}{16}$	$4\frac{1}{2} \times 4\frac{1}{2} \times \frac{11}{16}$	8	4
35200 and 40000 under	$26 \times \frac{14}{16}$	$\frac{12}{16}$	$\frac{9}{16}$	$6\frac{1}{2} \times 4\frac{1}{2} \times \frac{10}{16}$	$4 \times 4 \times \frac{9}{16}$	$4\frac{1}{2} \times 4\frac{1}{2} \times \frac{11}{16}$	$8\frac{1}{2}$	$4\frac{1}{2}$
40000 and 48500 under	$28 \times \frac{14}{16}$	$\frac{12}{16}$	$\frac{9}{16}$	$6\frac{1}{2} \times 4\frac{1}{2} \times \frac{10}{16}$	$4 \times 4 \times \frac{9}{16}$	$4\frac{1}{2} \times 4\frac{1}{2} \times \frac{11}{16}$	—	—
48500 and 56000 under	$30 \times \frac{15}{16}$	$\frac{13}{16}$	$\frac{9}{16}$	$6\frac{1}{2} \times 4\frac{1}{2} \times \frac{10}{16}$	$4 \times 4 \times \frac{9}{16}$	$5 \times 5 \times \frac{11}{16}$	—	—
56000 and 67000 under	$32 \times \frac{15}{16}$	$\frac{13}{16}$	$\frac{9}{16}$	$6\frac{1}{2} \times 4\frac{1}{2} \times \frac{10}{16}$	$4 \times 4 \times \frac{9}{16}$	$5 \times 5 \times \frac{11}{16}$	—	—



STRINGER ANGLES, DECKS, RUDDERS, CEILING, AND WINDLASSES.

RUDDER.		Thickness of upper deck.  (a)		Thick-ness of wood ceiling in hold, to upper part of bilges.	WINDLASS.				NUMBERS.  To regulate keelsons stringers, decks, rudders, ceiling, and windlasses.	
Steam Vessels.					Sailing Vessels.		Steam Vessels.			
Diam. at the head.	Diam. at the heel & pintle.	Wood.	Iron.		Diam. of iron Spindle.	Diam. of main piece.	Diam. of iron Spindle.	Diam. of main piece.		
inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.			
3	2	2½	—	2	2¼	12½	2	12	2600 and under 3400	
3½	2	3	—	2	2½	14	2¼	13	3400 and under 5200	
3¾	2¼	3	5/16	2	2¾	15	2½	14	5200 and under 7200	
4¼	2½	3½	5/16	2½	3	16	2¾	15	7200 and under 8900	
4½	2¾	3½	5/16	2½	3¼	17	2¾	15	8900 and under 10450	
4¾	2¾	3½	5/16	2½	3½	18	3	16	10450 and under 11800	
5	3	3½	5/16	2½	3⅝	19	3¼	17	11800 and under 13100	
5¼	3	3½	6/16	2½	3¾	20	3¼	17	13100 and under 14300	
5½	3	3½	6/16	2½	4	21	3½	18	14300 and under 15500	
5¾	3	4	6/16	2½	4¼	22	3⅝	19	15500 and under 16600	
6¼	3¼	4	6/16	2½	4½	23	3⅝	19	16600 and under 18700	
7	3½	4	6/16	2½	4⅝	24	4	21	18700 and under 21700	
7¾	3¾	4	6/16	2½	4⅝	25½	4½	23	21700 and under 26400	
8½	4	4	7/16	2½	4¾	27	4⅝	24	26400 and under 30900	
9	4½	4	—	2½	4¾	28½	4⅝	25½	30900 and under 35200	
9½	4¾	4	—	2½	5	30	4¾	27	35200 and under 40000	
10	5	4	—	2½	—	—	—	—	40000 and under 48500	
10½	5¼	4	—	2½	—	—	—	—	48500 and under 56000	
11	5½	4	—	2½	—	—	—	—	56000 and under 67000	

(4) When the deck is of Teak, it may be one-sixth less in thickness. When an iron deck is substituted for a wood one, it is not to be less than as given above, and supported by beams as in the case of iron decks required by Table G 5. When the deck is of iron as required by the Rules, it is to be in thickness as given in Table G 5.

MEM.—The Scantlings given in the above Table are intended for Vessels, the length of which does not exceed *eleven times* their depth from top of keel, see Section 1. For Vessels which exceed this proportion, see Section 46, and Table G 6. For proportions of breadth to length, see Table G 5.

DIAMETER OF NUT AND SCREW BOLTS FOR FASTENING FLAT OF DECK.			
3 ins. and under	3½ ins...	4 "	4 inches
1 inch.	1½ "	1¾ "	2 "





# IRON VESSELS.

## BEAMS.

Beam No.	Beam Length	Beam Depth	Beam Breadth	Beam Weight	Beam Volume	Beam Surface Area	Beam Moment of Inertia	Beam Section Modulus	Beam Torsion Constant
16	10	10	10	10	10	10	10	10	10
18	10	10	10	10	10	10	10	10	10
20	10	10	10	10	10	10	10	10	10
22	10	10	10	10	10	10	10	10	10
24	10	10	10	10	10	10	10	10	10
26	10	10	10	10	10	10	10	10	10
28	10	10	10	10	10	10	10	10	10
30	10	10	10	10	10	10	10	10	10
32	10	10	10	10	10	10	10	10	10
34	10	10	10	10	10	10	10	10	10
36	10	10	10	10	10	10	10	10	10
38	10	10	10	10	10	10	10	10	10
40	10	10	10	10	10	10	10	10	10
42	10	10	10	10	10	10	10	10	10
44	10	10	10	10	10	10	10	10	10
46	10	10	10	10	10	10	10	10	10
48	10	10	10	10	10	10	10	10	10
50	10	10	10	10	10	10	10	10	10

The above table gives the dimensions of the beams in feet and inches, and the weight in pounds per foot. The volume is in cubic feet, and the surface area is in square feet. The moment of inertia is in inch<sup>4</sup>, and the section modulus is in inch<sup>3</sup>. The torsion constant is in inch<sup>4</sup>.

For further information, please refer to the "Iron Vessels" section of the "Shipbuilding" volume, published by the Admiralty, London, 1892.

White Iron Works, Ltd., London, E.C.

254 April, 1892.



# IRON VESSELS.

Length of Beam amidships.	Upper and Lower Deck Beams in one and two-decked Vessels, Main and Lower Deck Beams in "Three deck" and spar-decked Vessels, and Beams of raised quarter decks.										Upper Deck Beams in "Three-deck" Vessels. (α)										Size of Spar-deck Beams (α) all fore and aft, and Forecastle Beams.		
	Size of Beams amidships.					Size of Beams less than three-fourths the length of the mid-ship Beam.					Size of Beams amidships.					Size of Beams less than three-fourths the length of the mid-ship Beam.							
	Bulb Plate.	ins.	ins.	Single Angle Bars.	ins.	ins.	Bulb Plate.	ins.	ins.	Double Angle Bars.	ins.	ins.	ins.	Bulb Plate.	ins.	ins.	Double Angle Bars.	ins.	ins.	ins.		Bulb Plate.	ins.
16				4½ × 3	× 6/16																		
18				5 × 3	× 7/16																		
20	5 × 5/16			Double Angle Bars																			
	Sng. Ang. Bar			2 × 2	× 5/16																		
				5½ × 3	× 7/16																		
22	5½ × 5/16			2½ × 2¼	× 5/16																		
24	6 × 6/16			2½ × 2½	× 5/16		5½ × 5/16			2½ × 2½	× 5/16												
26	6½ × 6/16			2½ × 2½	× 6/16		6 × 6/16			2½ × 2½	× 6/16			6 × 6/16			2½ × 2½	× 5/16					5½ × 5/16
28	7 × 7/16			3 × 3	× 6/16		6½ × 6/16			3 × 3	× 6/16			6½ × 6/16			2½ × 2½	× 6/16					6 × 6/16
30	7½ × 7/16			3 × 3	× 6/16		7 × 7/16			3 × 3	× 6/16			7 × 7/16			2½ × 2½	× 6/16					6½ × 6/16
32	8 × 8/16			3 × 3	× 6/16		7 × 7/16			3 × 3	× 6/16			7 × 7/16			3 × 3	× 6/16					6½ × 6/16
34	8½ × 8/16			3 × 3	× 7/16		7½ × 7/16			3 × 3	× 7/16			7½ × 7/16			3 × 3	× 6/16					7 × 7/16
36	9 × 9/16			3½ × 3	× 7/16		8 × 8/16			3½ × 3	× 7/16			8 × 8/16			3 × 3	× 6/16					7½ × 7/16
38	9½ × 9/16			3½ × 3½	× 7/16		8½ × 8/16			3½ × 3½	× 7/16			8½ × 8/16			3½ × 3	× 7/16					8 × 8/16
40	10 × 10/16			3½ × 3½	× 7/16		9 × 9/16			3½ × 3½	× 7/16			9 × 9/16			3½ × 3	× 7/16					8½ × 8/16
42	10½ × 10/16			3½ × 3½	× 8/16		9 × 9/16			3½ × 3½	× 8/16			9½ × 9/16			3½ × 3½	× 7/16					9 × 8/16
44	11 × 10/16			3½ × 3½	× 8/16		9½ × 9/16			3½ × 3½	× 8/16			10 × 10/16			3½ × 3½	× 7/16					9½ × 9/16
46	11½ × 10/16			3½ × 3½	× 8/16		10 × 10/16			3½ × 3½	× 8/16			10 × 10/16			3½ × 3½	× 8/16					9½ × 9/16
48	12 × 10/16			3½ × 3½	× 8/16		10½ × 10/16			3½ × 3½	× 8/16			10½ × 10/16			3½ × 3½	× 8/16					10 × 9/16
50	12 × 11/16			3½ × 3½	× 9/16		11 × 10/16			3½ × 3½	× 8/16			11 × 10/16			3½ × 3½	× 8/16					10½ × 9/16

The size of all beams (with the exception of those of spar decks, awning decks, poops and forecastles), which are not less in length than three-fourths of the length of the midship beam, to be of the size given above for beams amidships; those of less length may be of the size given above, excepting those at hatchways exceeding in length four spaces of frames, mast and windlass beams, and beams under deck houses and the heel of bowsprit, which must not be less in size than the midship beam.

Strong beams in the machinery space must in all cases have double angle bars on their upper and lower edges.

No reduction is admitted at the ends of vessels in the size of spar and awning deck beams, and beams of poops and forecastles from those given above.

Where a poop, bridge, or forecastle is fitted on a spar deck, the beams may be one grade smaller than given above for poop, bridge, and forecastle beams.

The beams to fore and after peak tanks to be fitted to every frame, and to be of the size required for main deck beams at the ends of the vessel. Butterley beams, when substituted for bulb plate and double angles, may, except in the case of wide spaced strong hold beams be of the depth and thickness given for bulb beams in Table.



# BEAMS.

## TABLE G 4.

Size of Spar-deck Beams (a) all fore and aft, and Fore-castle Beams.	Size of Awning Deck Beams, Poop Beams, and Bridge Beams (α).		Hold Beams (b) of Extra Strength.		Beams on every frame where Iron Decks are fitted (c).								
					One, two & "Three deck" Vessels.			Spar deck.			Awning deck, Poop, Bridge, and Forecastle (d).		
Double Angle Bars. ins. ins. ins.	Bulb Plate. ins. ins.	Single Angle Bars. ins. ins. ins.	Plt. or Bulb Plt. ins. ins.	Size of Angle Bars. ins. ins. ins.	ins. ins. ins.	ins. ins. ins.	ins. ins. ins.	ins. ins. ins.	ins. ins. ins.	ins. ins. ins.	ins. ins. ins.	ins. ins. ins.	ins. ins. ins.
$4\frac{1}{2} \times 3 \times \frac{7}{16}$ Single Angle.													
$5 \times 3 \times \frac{7}{16}$ Single Angle.		$4\frac{1}{2} \times 3 \times \frac{6}{16}$				$4 \times 2\frac{1}{2} \times \frac{6}{16}$							
$5\frac{1}{2} \times 3 \times \frac{7}{16}$ Single Angle.		$5 \times 3 \times \frac{6}{16}$	$7 \times \frac{7}{16}$	$3 \times 3 \times \frac{6}{16}$	$5 \times 3 \times \frac{6}{16}$	$4 \times 2\frac{1}{2} \times \frac{6}{16}$							
$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{16}$		$5 \times 3 \times \frac{7}{16}$	$7\frac{1}{2} \times \frac{7}{16}$	$3 \times 3 \times \frac{7}{16}$	$5 \times 3 \times \frac{7}{16}$	$5 \times 3 \times \frac{6}{16}$							
$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{16}$		$5\frac{1}{2} \times 3 \times \frac{7}{16}$	$8 \times \frac{8}{16}$	$4 \times 3 \times \frac{7}{16}$	$5\frac{1}{2} \times 3 \times \frac{7}{16}$	$5 \times 3 \times \frac{7}{16}$	$4 \times 2\frac{1}{2} \times \frac{6}{16}$						
$3 \times 2\frac{1}{2} \times \frac{5}{16}$		$6 \times 3 \times \frac{7}{16}$	$8\frac{1}{2} \times \frac{8}{16}$	$4 \times 3 \times \frac{7}{16}$	$5\frac{1}{2} \times 3 \times \frac{8}{16}$	$5\frac{1}{2} \times 3 \times \frac{7}{16}$	$4\frac{1}{2} \times 3 \times \frac{6}{16}$						
$3 \times 3 \times \frac{5}{16}$		$6\frac{1}{2} \times 3 \times \frac{8}{16}$	$9 \times \frac{9}{16}$	$4 \times 3\frac{1}{2} \times \frac{8}{16}$	$5\frac{1}{2} \times 3 \times \frac{8}{16}$ Bulb Angle.	$5\frac{1}{2} \times 3 \times \frac{8}{16}$	$5 \times 3 \times \frac{6}{16}$						
$3 \times 3 \times \frac{6}{16}$	$6 \times \frac{6}{16}$ Bulb Angle.	Double Angle Bars. $2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{16}$ $6\frac{1}{2} \times 3 \times \frac{6}{16}$	$9\frac{1}{2} \times \frac{9}{16}$	$4 \times 4 \times \frac{8}{16}$	$6 \times 3 \times \frac{8}{16}$ Bulb Angle.	$5\frac{1}{2} \times 3 \times \frac{8}{16}$ Bulb Angle.	$5 \times 3 \times \frac{7}{16}$						
$3 \times 3 \times \frac{6}{16}$	$6\frac{1}{2} \times \frac{6}{16}$ Bulb Angle.	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{6}{16}$ $7 \times 3 \times \frac{8}{16}$	$10 \times \frac{10}{16}$	$4 \times 4 \times \frac{9}{16}$	$6\frac{1}{2} \times 3 \times \frac{9}{16}$ Bulb Angle.	$6 \times 3 \times \frac{8}{16}$ Bulb Angle.	$5\frac{1}{2} \times 3 \times \frac{7}{16}$						
$3 \times 3 \times \frac{6}{16}$	$7 \times \frac{7}{16}$	$3 \times 2\frac{1}{2} \times \frac{6}{16}$	$10\frac{1}{2} \times \frac{10}{16}$	$4\frac{1}{2} \times 4 \times \frac{9}{16}$	$7\frac{1}{2} \times 3 \times \frac{9}{16}$ Bulb Angle.	$6\frac{1}{2} \times 3 \times \frac{8}{16}$ Bulb Angle.	$6 \times 3 \times \frac{8}{16}$						
$3 \times 3 \times \frac{6}{16}$	$7\frac{1}{2} \times \frac{7}{16}$	$3 \times 3 \times \frac{6}{16}$	$11 \times \frac{11}{16}$	$5 \times 4 \times \frac{9}{16}$	$7\frac{1}{2} \times 3 \times \frac{10}{16}$ Bulb Angle.	$7 \times 3 \times \frac{9}{16}$ Bulb Angle.	$6 \times 3 \times \frac{8}{16}$ Bulb Angle.						
$3\frac{1}{2} \times 3 \times \frac{7}{16}$	$8 \times \frac{8}{16}$	$3 \times 3 \times \frac{6}{16}$	$11\frac{1}{2} \times \frac{11}{16}$	$5 \times 4 \times \frac{9}{16}$	$8 \times 3 \times \frac{11}{16}$ Bulb Angle.	$7\frac{1}{2} \times 3 \times \frac{10}{16}$ Bulb Angle.	$6\frac{1}{2} \times 3 \times \frac{8}{16}$ Bulb Angle.						
$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	$8\frac{1}{2} \times \frac{8}{16}$	$3 \times 3 \times \frac{7}{16}$	$12 \times \frac{12}{16}$	$5\frac{1}{2} \times 4 \times \frac{9}{16}$									
$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	$9 \times \frac{9}{16}$	$3\frac{1}{2} \times 3 \times \frac{7}{16}$	$12 \times \frac{12}{16}$	$6 \times 4 \times \frac{9}{16}$									
$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	$9\frac{1}{2} \times \frac{9}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	$13 \times \frac{13}{16}$	$6 \times 4 \times \frac{10}{16}$									
$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{16}$	$10 \times \frac{9}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	$13 \times \frac{13}{16}$	$6 \times 4 \times \frac{10}{16}$									

- (a) The beams at the ends of hatchways from six to ten frame spaces in length, must be equal in size to those of the main deck; and in awning decks and long bridges to be of the size of spar deck beams.
- (b) These beams are to be formed with either a plate with double angle bars on its upper and lower edges, or a bulb plate with double angle bars and a covering plate on its upper edge. The beam plates and angle bars are to be of the sizes given above, and the broad flanges of the angle bars are to be fitted horizontally; the covering plate is to be of the thickness given for the angle bars. Strong beams at the spar deck in machinery space may be of the size of main deck beams of the same length, with double angle bars on their upper and lower edges of the size given for the corresponding beam, in "hold beams of extra strength." Semi-box beams may be adopted in lieu thereof, formed of bulb plate and single angle bars of the sizes given for ordinary beams, secured in the usual way to two consecutive frames, and plated over by plating six-sixteenths of an inch in thickness.
- (c) Beams to every frame, when eight-sixteenths of an inch thick or above, may be reduced one-sixteenth of an inch in thickness, where less than three-fourths of the length of the amidship beam.
- (d) Bulb beams of the size required for spar deck beams to be fitted in way of windlass or capstan.
- The width of the bulb of bulb plates and tee bulbs to be 3.2 times the thickness of the webs, and in bulb angles  $2\frac{1}{2}$  times the thickness of the webs.









# IRON VESSELS.

## Table of Minimum Dimensions of STRINGER

PLATING NUMBERS OF VESSELS. (See Section 2.)	2000 to 3000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
Under 10 Depths, or Under 8 Breadths in Length.	$20 \times \frac{5}{16}$	$20 \times \frac{6}{16}$	$23 \times \frac{6}{16}$	$26 \times \frac{6}{16}$	$28 \times \frac{6}{16}$	$28 \times \frac{7}{16}$	$30 \times \frac{7}{16}$	$32 \times \frac{7}{16}$	$32 \times \frac{8}{16}$	$34 \times \frac{8}{16}$	$36 \times \frac{8}{16}$
10 to 11 Depths, or 8 to $8\frac{1}{2}$ Breadths.	$22 \times \frac{5}{16}$	$22 \times \frac{6}{16}$	$25 \times \frac{6}{16}$	$28 \times \frac{6}{16}$	$31 \times \frac{6}{16}$	$32 \times \frac{7}{16}$	$34 \times \frac{7}{16}$	$36 \times \frac{7}{16}$	$36 \times \frac{8}{16}$	$38 \times \frac{8}{16}$	$40 \times \frac{8}{16}$
11 to 12 Depths, or $8\frac{1}{2}$ to 9 Breadths.	$24 \times \frac{5}{16}$	$25 \times \frac{6}{16}$	$28 \times \frac{6}{16}$	$31 \times \frac{6}{16}$	$34 \times \frac{6}{16}$	$36 \times \frac{7}{16}$	$38 \times \frac{7}{16}$	$40 \times \frac{7}{16}$	$40 \times \frac{8}{16}$	$42 \times \frac{8}{16}$	$44 \times \frac{8}{16}$
12 to 13 Depths, or 9 to $9\frac{1}{2}$ Breadths.	$24 \times \frac{6}{16}$	$25 \times \frac{7}{16}$	$28 \times \frac{7}{16}$	$31 \times \frac{7}{16}$	$34 \times \frac{7}{16}$	$36 \times \frac{8}{16}$	$38 \times \frac{8}{16}$	$40 \times \frac{8}{16}$	$40 \times \frac{9}{16}$	$42 \times \frac{9}{16}$	$44 \times \frac{9}{16}$
13 to 14 Depths, or $9\frac{1}{2}$ to 10 Breadths.	$27 \times \frac{6}{16}$	$28 \times \frac{7}{16}$	$31 \times \frac{7}{16}$	$34 \times \frac{7}{16}$	$37 \times \frac{7}{16}$	$40 \times \frac{8}{16}$	$42 \times \frac{8}{16}$	$44 \times \frac{8}{16}$	$44 \times \frac{9}{16}$	$44 \times \frac{9}{16}$	$46 \times \frac{9}{16}$
14 to 15 Depths, or 10 to $10\frac{1}{2}$ Breadths.	$30 \times \frac{6}{16}$	$31 \times \frac{7}{16}$	$31 \times \frac{8}{16}$	$34 \times \frac{8}{16}$	$37 \times \frac{8}{16}$	$40 \times \frac{9}{16}$	$42 \times \frac{9}{16}$	$44 \times \frac{9}{16}$	$44 \times \frac{10}{16}$	$46 \times \frac{10}{16}$	$48 \times \frac{10}{16}$
15 to 16 Depths, or Over $10\frac{1}{2}$ Breadths.	$33 \times \frac{6}{16}$	$34 \times \frac{7}{16}$	$34 \times \frac{8}{16}$	$38 \times \frac{8}{16}$	$40 \times \frac{8}{16}$	$44 \times \frac{9}{16}$	$46 \times \frac{9}{16}$	$48 \times \frac{10}{16}$	$48 \times \frac{10}{16}$	$50 \times \frac{10}{16}$	$52 \times \frac{10}{16}$
Ends of Stringer Plates.			$15 \times \frac{5}{16}$	$17 \times \frac{5}{16}$	$19 \times \frac{5}{16}$	$19 \times \frac{6}{16}$	$20 \times \frac{6}{16}$	$22 \times \frac{6}{16}$	$22 \times \frac{7}{16}$	$23 \times \frac{7}{16}$	$24 \times \frac{7}{16}$
Hold and Lower Deck Beam Stringer Plates (extreme breadth). <i>Ends of ditto.</i>						$20 \times \frac{6}{16}$	$21 \times \frac{6}{16}$	$22 \times \frac{6}{16}$	$23 \times \frac{7}{16}$	$25 \times \frac{7}{16}$	$27 \times \frac{7}{16}$
						$16 \times \frac{5}{16}$	$16 \times \frac{5}{16}$	$17 \times \frac{5}{16}$	$18 \times \frac{6}{16}$	$19 \times \frac{6}{16}$	$21 \times \frac{6}{16}$
Tie Plates on Beams, Fore-and-aft, and Diagonals. <i>Ends of ditto.</i>			$7 \times \frac{6}{16}$	$7 \times \frac{6}{16}$	$7 \times \frac{6}{16}$	$8 \times \frac{7}{16}$	$8 \times \frac{7}{16}$	$9 \times \frac{7}{16}$	$9 \times \frac{8}{16}$	$10 \times \frac{8}{16}$	$10 \times \frac{8}{16}$
			$7 \times \frac{5}{16}$	$7 \times \frac{5}{16}$	$7 \times \frac{5}{16}$	$8 \times \frac{6}{16}$	$8 \times \frac{6}{16}$	$9 \times \frac{6}{16}$	$9 \times \frac{7}{16}$	$10 \times \frac{7}{16}$	$10 \times \frac{7}{16}$

1. The depths for proportions to be taken from upper side of keel to top of upper deck beams in one, two, and three deck ships, and to top of main deck in spar and awning deck vessels; and, in spar-decked vessels, two depths may be taken off the proportions, so that in a spar-decked vessel of thirteen and under fourteen depths in length, the stringers, &c., may be of the sizes given in the above Table for vessels of eleven and under twelve depths in length; and so on.

2. In two decked vessels the stringer plates indicated with regard to the vessel's proportions in the above Table are to be fitted to the upper deck beams.

3. In three decked vessels the stringer plates so indicated in the above Table are to be fitted to both upper and middle deck beams.

4. In spar decked vessels the stringer plates given in the above Table are to be fitted to the main deck beams; and the stringer plates required for the spar deck beams are to be the breadth of, and may be  $\frac{1}{16}$  of an inch less in thickness than the stringer plates given on the upper line of the Table for vessels of the same plating number, and may be reduced at their ends  $\frac{1}{16}$  of an inch in thickness, before and abaft the half length amidships, and to the breadth given for the ends of the main deck stringer plate in the Table.



TABLE G 5.

PLATES, IRON DECKS AND TIE PLATES.

(For Nos. 27000 to 72000 see Continuation.)

13000	14000	15000	16000	17000	18000	19000	20000	21000	22000	23000	24000	25000
$36 \times \frac{9}{16}$	$40 \times \frac{9}{16}$	$42 \times \frac{9}{16}$	$42 \times \frac{10}{16}$	$44 \times \frac{10}{16}$	$46 \times \frac{10}{16}$	$48 \times \frac{10}{16}$	$50 \times \frac{10}{16}$	$52 \times \frac{10}{16}$	$54 \times \frac{10}{16}$	$54 \times \frac{10}{16}$	$56 \times \frac{10}{16}$	Complete Irn Dk $\frac{6}{16}$ $\frac{1}{2}$ Len Amid
$40 \times \frac{9}{16}$	$44 \times \frac{9}{16}$	$46 \times \frac{9}{16}$	$46 \times \frac{10}{16}$	$48 \times \frac{10}{16}$	$50 \times \frac{10}{16}$	$52 \times \frac{10}{16}$	$52 \times \frac{10}{16}$	$54 \times \frac{10}{16}$	$56 \times \frac{10}{16}$	$58 \times \frac{10}{16}$	$60 \times \frac{10}{16}$	$62 \times \frac{10}{16}$
							Irn Dk $\frac{6}{16}$	for $\frac{1}{2}$ Lgth	Amidships	Complete	Iron	Deck $\frac{6}{16}$
$44 \times \frac{9}{16}$	$48 \times \frac{9}{16}$	$50 \times \frac{9}{16}$	$46 \times \frac{10}{16}$	$48 \times \frac{10}{16}$	$50 \times \frac{10}{16}$	$52 \times \frac{10}{16}$	$54 \times \frac{10}{16}$	$56 \times \frac{10}{16}$	$58 \times \frac{10}{16}$	$60 \times \frac{10}{16}$	$62 \times \frac{10}{16}$	$64 \times \frac{10}{16}$
			Iron Deck $\frac{6}{16}$	for Hlf	Length	Amidships	Complete	Iron	Deck $\frac{6}{16}$	Complete	Iron	Deck $\frac{7}{16}$
$44 \times \frac{10}{16}$	$46 \times \frac{10}{16}$	$48 \times \frac{10}{16}$	$50 \times \frac{10}{16}$	$52 \times \frac{10}{16}$	$54 \times \frac{10}{16}$	$56 \times \frac{10}{16}$	$58 \times \frac{10}{16}$	$60 \times \frac{10}{16}$	$62 \times \frac{10}{16}$	$64 \times \frac{10}{16}$	$66 \times \frac{10}{16}$	$68 \times \frac{10}{16}$
Iron Deck $\frac{6}{16}$	for Hlf	Length	Amidships	Complete	Iron	Deck $\frac{6}{16}$		Complete	Iron	Deck $\frac{7}{16}$		
$46 \times \frac{10}{16}$	$48 \times \frac{10}{16}$	$50 \times \frac{10}{16}$	$52 \times \frac{10}{16}$	$54 \times \frac{10}{16}$	$58 \times \frac{10}{16}$	$60 \times \frac{10}{16}$	$62 \times \frac{10}{16}$	$64 \times \frac{10}{16}$	$66 \times \frac{10}{16}$	$68 \times \frac{10}{16}$	$70 \times \frac{10}{16}$	Cpl Irn $\frac{7}{16}$ Up Dk $\frac{1}{16}$
Len Amidships	Complete	Iron	Deck $\frac{6}{16}$			Complete	Iron	Deck $\frac{7}{16}$				& Mdl $\frac{7}{16}$ Dk $\frac{1}{16}$
$50 \times \frac{10}{16}$	$52 \times \frac{10}{16}$	$54 \times \frac{10}{16}$	$56 \times \frac{10}{16}$	$58 \times \frac{10}{16}$	$62 \times \frac{10}{16}$	$64 \times \frac{10}{16}$	$66 \times \frac{10}{16}$	$68 \times \frac{10}{16}$	$46 \times \frac{10}{16}$	$48 \times \frac{10}{16}$	$50 \times \frac{10}{16}$	$52 \times \frac{10}{16}$
Iron	Deck $\frac{6}{16}$			Complete	Iron	Deck $\frac{7}{16}$		Complete	Iron Upper	Deck $\frac{7}{16}$	Cmpl Irn Upper &	
									and Middle	Dk for Hlf	Length $\frac{7}{16}$	Mdl Dk $\frac{7}{16}$
$54 \times \frac{10}{16}$	$56 \times \frac{10}{16}$	$58 \times \frac{10}{16}$	$60 \times \frac{10}{16}$	$62 \times \frac{10}{16}$	$64 \times \frac{10}{16}$	$44 \times \frac{10}{16}$	$45 \times \frac{10}{16}$	$46 \times \frac{10}{16}$	$47 \times \frac{10}{16}$	$48 \times \frac{10}{16}$	$50 \times \frac{10}{16}$	$52 \times \frac{10}{16}$
						and Middle	Dk for Hlf	Length $\frac{7}{16}$	Middle	Deck $\frac{7}{16}$	thick	and Mdl Dk $\frac{7}{16}$
$24 \times \frac{8}{16}$	$26 \times \frac{8}{16}$	$28 \times \frac{8}{16}$	$28 \times \frac{8}{16}$	$29 \times \frac{8}{16}$	$30 \times \frac{8}{16}$	$31 \times \frac{8}{16}$	$32 \times \frac{8}{16}$	$33 \times \frac{8}{16}$	$35 \times \frac{8}{16}$	$36 \times \frac{8}{16}$	$36 \times \frac{8}{16}$	$37 \times \frac{8}{16}$
$28 \times \frac{8}{16}$	$29 \times \frac{8}{16}$	$30 \times \frac{8}{16}$	$31 \times \frac{9}{16}$	$32 \times \frac{9}{16}$	$33 \times \frac{9}{16}$	$34 \times \frac{9}{16}$	$35 \times \frac{9}{16}$	$37 \times \frac{9}{16}$	$38 \times \frac{9}{16}$	$39 \times \frac{9}{16}$	$40 \times \frac{9}{16}$	$41 \times \frac{9}{16}$
$22 \times \frac{7}{16}$	$23 \times \frac{7}{16}$	$24 \times \frac{7}{16}$	$24 \times \frac{8}{16}$	$25 \times \frac{8}{16}$	$26 \times \frac{8}{16}$	$26 \times \frac{8}{16}$	$27 \times \frac{8}{16}$	$28 \times \frac{8}{16}$	$29 \times \frac{8}{16}$	$30 \times \frac{8}{16}$	$31 \times \frac{8}{16}$	$32 \times \frac{8}{16}$
$10 \times \frac{9}{16}$	$11 \times \frac{9}{16}$	$12 \times \frac{9}{16}$	$12 \times \frac{10}{16}$	$13 \times \frac{10}{16}$	$13 \times \frac{10}{16}$	$13 \times \frac{10}{16}$	$14 \times \frac{10}{16}$	$14 \times \frac{10}{16}$	$15 \times \frac{10}{16}$	$15 \times \frac{10}{16}$	$15 \times \frac{10}{16}$	$16 \times \frac{10}{16}$
$10 \times \frac{8}{16}$	$11 \times \frac{8}{16}$	$12 \times \frac{8}{16}$	$12 \times \frac{8}{16}$	$13 \times \frac{8}{16}$	$13 \times \frac{8}{16}$	$13 \times \frac{8}{16}$	$14 \times \frac{8}{16}$	$14 \times \frac{8}{16}$	$15 \times \frac{8}{16}$	$15 \times \frac{8}{16}$	$15 \times \frac{8}{16}$	$16 \times \frac{8}{16}$

5. In awning decked vessels the stringer plates given in the above Table are to be fitted to the main deck beams, and the stringer plates required for the awning deck beams are to be of the same width as those given in the Table for hold beam stringer plates, and to be of the following thicknesses, viz. :—

In Vessels whose plating number is under 14,000, not less than  $\frac{6}{16}$  of an inch.

14,000 and under 26,400	"	"	$\frac{7}{16}$	"
26,400	"	30,900	"	$\frac{8}{16}$

6. All stringer plates are to maintain their midship breadth for one-half the vessel's length amidships, from thence the breadth may be gradually reduced to that given above for the ends of the vessel.



# IRON VESSELS.

Table of Minimum Dimensions of STRINGER

PLATING NUMBERS OF VESSELS. (See Section 2.)	27000	28000	29000	31000	32000	34000	35000	36000	38000	39000
Under 10 Depths, or Under 8 Breadths in Length.	60 × $\frac{10}{16}$ Cmpl Iron	62 × $\frac{10}{16}$ Deck $\frac{6}{16}$	65 × $\frac{10}{16}$	68 × $\frac{10}{16}$ Cmpl Iron	70 × $\frac{10}{16}$ Deck $\frac{7}{16}$	72 × $\frac{10}{16}$	Cmpl Iron & Mid Dk	Up Dk $\frac{7}{16}$ ½ Lgth $\frac{7}{16}$	Cmpl Iron Middle	Upper Deck
10 to 11 Depths, or 8 to 8½ Breadths.	64 × $\frac{10}{16}$	66 × $\frac{10}{16}$ Complete	68 × $\frac{10}{16}$ Iron	70 × $\frac{10}{16}$ Deck $\frac{7}{16}$	72 × $\frac{10}{16}$	Cmpl Iron & Mid Dk	Up Dk $\frac{7}{16}$ ½ Lgth $\frac{7}{16}$	Cmpl Iron Middle	Upper and Deck $\frac{7}{16}$	Cmpl Iron
11 to 12 Depths, or 8½ to 9 Breadths.	66 × $\frac{10}{16}$ Complete	68 × $\frac{10}{16}$ Iron	70 × $\frac{10}{16}$ Deck $\frac{7}{16}$	Cmpl Iron & Mid Dk	Up Dk $\frac{7}{16}$ ½ Lgth $\frac{7}{16}$	Cmpl Iron Middle	Upper Deck	and $\frac{7}{16}$	Cmpl Iron and	Upper Middle
12 to 13 Depths, or 9 to 9½ Breadths.	Cmpl Iron 70 × $\frac{10}{16}$ Deck $\frac{7}{16}$	Cmpl Iron 53 × $\frac{10}{16}$ & Mid Dk	Up Dk $\frac{7}{16}$ 54 × $\frac{10}{16}$ ½ Lgth $\frac{7}{16}$	Cmpl Iron 55 × $\frac{10}{16}$ Middle	Upper and 56 × $\frac{10}{16}$ Deck $\frac{7}{16}$	Cmpl Iron 57 × $\frac{10}{16}$ and	Upper Middle Dk	Deck $\frac{8}{16}$ $\frac{7}{16}$	Cmpl Iron Middle	Upper Deck
13 to 14 Depths, or 9½ to 10 Breadths.	Cmpl Iron 52 × $\frac{10}{16}$ & Mid Dk $\frac{7}{16}$	Cmpl Iron 53 × $\frac{10}{16}$ Middle	Upper and 54 × $\frac{10}{16}$ Deck $\frac{7}{16}$	Cmpl Iron 55 × $\frac{10}{16}$ & Middle	Up Dk $\frac{8}{16}$ Deck $\frac{7}{16}$	Cmpl Iron 57 × $\frac{10}{16}$ Middle	Upper Deck	and $\frac{8}{16}$	Cmpl Iron and	Upper Middle Dk
14 to 15 Depths, or 10 to 10½ Breadths.	Cmpl Iron 53 × $\frac{10}{16}$ and Mid Dk $\frac{7}{16}$	Cmpl Iron 54 × $\frac{10}{16}$ & Mid Dk	Up Dk $\frac{8}{16}$ 55 × $\frac{10}{16}$ $\frac{7}{16}$ thick	Cmpl Iron 56 × $\frac{10}{16}$ Middle	Upper and 57 × $\frac{10}{16}$ Deck $\frac{8}{16}$	Cmpl Iron 58 × $\frac{10}{16}$ and	Upper Middle Dk	Deck $\frac{9}{16}$ $\frac{8}{16}$	Cmpl Iron Middle	Upper Deck $\frac{9}{16}$
15 to 16 Depths, or over 10½ Breadths.	Cmpl Iron 53 × $\frac{10}{16}$ and Mid Dk $\frac{7}{16}$	Cmpl Iron 54 × $\frac{10}{16}$ Middle Dk	Upper and 55 × $\frac{10}{16}$ $\frac{8}{16}$ thick							
Ends of Stringer Plates.	38 × $\frac{8}{16}$	40 × $\frac{8}{16}$	41 × $\frac{8}{16}$	42 × $\frac{8}{16}$	43 × $\frac{8}{16}$	44 × $\frac{8}{16}$	45 × $\frac{9}{16}$	45 × $\frac{9}{16}$	46 × $\frac{9}{16}$	47 × $\frac{9}{16}$
Hold and Lower Deck Beam Stringer Plates (extreme breadth.) <i>Ends of ditto.</i>	42 × $\frac{9}{16}$ 33 × $\frac{8}{16}$	43 × $\frac{9}{16}$ 33 × $\frac{8}{16}$	44 × $\frac{9}{16}$ 34 × $\frac{8}{16}$	45 × $\frac{9}{16}$ 35 × $\frac{8}{16}$	46 × $\frac{9}{16}$ 36 × $\frac{8}{16}$	47 × $\frac{9}{16}$ 36 × $\frac{8}{16}$	48 × $\frac{9}{16}$ 37 × $\frac{8}{16}$	50 × $\frac{9}{16}$ 38 × $\frac{8}{16}$	51 × $\frac{9}{16}$ 40 × $\frac{8}{16}$	52 × $\frac{9}{16}$ 41 × $\frac{8}{16}$
Tie Plates on Beams, Fore-and-aft, and Diagonals. <i>Ends of ditto.</i>	16 × $\frac{10}{16}$ 16 × $\frac{8}{16}$	17 × $\frac{10}{16}$ 17 × $\frac{8}{16}$	17 × $\frac{10}{16}$ 17 × $\frac{8}{16}$	18 × $\frac{10}{16}$ 18 × $\frac{8}{16}$	18 × $\frac{10}{16}$ 18 × $\frac{8}{16}$	19 × $\frac{10}{16}$ 19 × $\frac{8}{16}$	19 × $\frac{10}{16}$ 19 × $\frac{8}{16}$	20 × $\frac{10}{16}$ 20 × $\frac{8}{16}$	20 × $\frac{10}{16}$ 20 × $\frac{8}{16}$	21 × $\frac{10}{16}$ 21 × $\frac{8}{16}$

7. Where a reduction of  $\frac{2}{16}$  of an inch from the midship thickness is allowed for the ends, the stringer plates may be reduced  $\frac{1}{16}$  of an inch in thickness for one-eighth of the vessel's length before and abaft the half length amidships, and from thence to the ends they may be reduced to the thickness required at ends.

8. Where there is an *iron deck* prescribed either for the entire length of the vessel, or for half the length amidships, it is to be fitted to the upper deck beams in two decked vessels. In three decked vessels and spar-decked vessels it may be fitted either to the upper or middle deck beams.

9. In way of an *iron deck* or *half-iron deck*, the stringer plates may be reduced in width to one inch for every seven feet of the length of the vessel, but the thickness is to be as given above, and at the ends of the vessel the stringer plates to be in accordance with the Table for "ends of stringer plates." Where more than one iron deck is required the stringer plates are to be of the breadth and thickness given in the Table.

10. Where an *iron deck* is prescribed in the Table to be fitted for one half the vessel's length amidships, it is to be maintained the full breadth of the vessel for that length, and then tapered gradually into the stringer plates for one-eighth the vessel's length at each end.



(Continued.)

PLATES, IRON DECKS AND TIE PLATES.

40000	42000	44000	46000	48000	50000	52000	54000	57000	60000	64000	68000	72000
and $60 \times \frac{1}{16}$ $\frac{7}{16}$ thick	Cmpl Iron $60 \times \frac{1}{16}$ and	Upper Dk $62 \times \frac{1}{16}$ Middle Dk	$\frac{8}{16}$ thick $64 \times \frac{1}{16}$ $\frac{7}{16}$ thick	Cmpl Iron $66 \times \frac{1}{16}$ Middle	Upper $68 \times \frac{1}{16}$ Deck	and $70 \times \frac{1}{16}$ $\frac{8}{16}$	Cmpl Iron $72 \times \frac{1}{16}$ and	Upper $74 \times \frac{1}{16}$ Middle Dk	Deck $76 \times \frac{1}{16}$ $\frac{8}{16}$	Cmpl Iron $78 \times \frac{1}{16}$ Middle	Upper $80 \times \frac{1}{16}$ Deck	and $82 \times \frac{1}{16}$ $\frac{9}{16}$
Upper Dk $60 \times \frac{1}{16}$ Deck	$\frac{8}{16}$ and $60 \times \frac{1}{16}$ $\frac{7}{16}$ thick	Middle $62 \times \frac{1}{16}$ thick	Cmpl Iron $64 \times \frac{1}{16}$ Middle	Upper $66 \times \frac{1}{16}$ Deck	and $68 \times \frac{1}{16}$ $\frac{8}{16}$	Cmpl Iron $70 \times \frac{1}{16}$ and	Upper Dk $72 \times \frac{1}{16}$ Middle Dk	$\frac{9}{16}$ $74 \times \frac{1}{16}$ $\frac{8}{16}$	Cmpl Iron $76 \times \frac{1}{16}$ Middle	Upper $78 \times \frac{1}{16}$ Deck	and $80 \times \frac{1}{16}$ $\frac{9}{16}$	3Dks $82 \times \frac{1}{16}$ $\frac{9}{16}$ & $\frac{7}{16}$
Deck $60 \times \frac{1}{16}$	Cmpl Iron $62 \times \frac{1}{16}$	Upper $64 \times \frac{1}{16}$	and $66 \times \frac{1}{16}$	Cmpl Iron $68 \times \frac{1}{16}$	Upper Dk $70 \times \frac{1}{16}$	$\frac{9}{16}$ $72 \times \frac{1}{16}$	$74 \times \frac{1}{16}$	Cmpl Iron $76 \times \frac{1}{16}$	Upper and $78 \times \frac{1}{16}$	$80 \times \frac{1}{16}$	Cmpl Iron $80 \times \frac{1}{16}$	Up Dk $82 \times \frac{1}{16}$ $\frac{10}{16}$
Deck $60 \times \frac{1}{16}$	Middle $62 \times \frac{1}{16}$	Deck $64 \times \frac{1}{16}$	thick $66 \times \frac{1}{16}$	and $68 \times \frac{1}{16}$	Middle Dk $70 \times \frac{1}{16}$	$\frac{8}{16}$ $72 \times \frac{1}{16}$	$74 \times \frac{1}{16}$	Middle Dk $76 \times \frac{1}{16}$	$\frac{9}{16}$ $78 \times \frac{1}{16}$	$80 \times \frac{1}{16}$	Md Dk $80 \times \frac{1}{16}$	Lr Dk $82 \times \frac{1}{16}$ $\frac{7}{16}$
and $61 \times \frac{1}{16}$ $\frac{8}{16}$ thick	Cmpl Iron $63 \times \frac{1}{16}$ and	Upper $65 \times \frac{1}{16}$ Middle	Deck $67 \times \frac{1}{16}$ $\frac{9}{16}$ thick	$69 \times \frac{1}{16}$	$71 \times \frac{1}{16}$	$73 \times \frac{1}{16}$	$75 \times \frac{1}{16}$	$77 \times \frac{1}{16}$	Cmpl Iron $78 \times \frac{1}{16}$ and	Upper Dk $80 \times \frac{1}{16}$ Lower	Middle $82 \times \frac{1}{16}$ Deck	Deck $82 \times \frac{1}{16}$ $\frac{9}{16}$ thick
Deck $61 \times \frac{1}{16}$ $\frac{8}{16}$ thick	Cmpl Iron $63 \times \frac{1}{16}$ Middle	Upper $65 \times \frac{1}{16}$ Deck	and $67 \times \frac{1}{16}$ $\frac{9}{16}$ thick	$69 \times \frac{1}{16}$	Cmpl Iron $71 \times \frac{1}{16}$ and	Upper Dk $73 \times \frac{1}{16}$ Lower	Middle $75 \times \frac{1}{16}$ Deck	$\frac{10}{16}$ $77 \times \frac{1}{16}$ $\frac{9}{16}$ thick	$79 \times \frac{1}{16}$			
and $62 \times \frac{1}{16}$ thick	Cmpl Iron $64 \times \frac{1}{16}$ and	Up Dk $66 \times \frac{1}{16}$ Lower	Md Dk $68 \times \frac{1}{16}$ $\frac{7}{16}$ thick									
$48 \times \frac{9}{16}$	$49 \times \frac{9}{16}$	$50 \times \frac{9}{16}$	$51 \times \frac{9}{16}$	$52 \times \frac{9}{16}$	$53 \times \frac{9}{16}$	$54 \times \frac{9}{16}$	$55 \times \frac{9}{16}$	$56 \times \frac{9}{16}$	$57 \times \frac{9}{16}$	$58 \times \frac{9}{16}$	$60 \times \frac{9}{16}$	$62 \times \frac{9}{16}$
$53 \times \frac{10}{16}$	$54 \times \frac{10}{16}$	$55 \times \frac{10}{16}$	$56 \times \frac{10}{16}$	$57 \times \frac{10}{16}$	$58 \times \frac{10}{16}$	$59 \times \frac{10}{16}$	$60 \times \frac{10}{16}$	$61 \times \frac{10}{16}$	$62 \times \frac{10}{16}$	$63 \times \frac{10}{16}$	$64 \times \frac{10}{16}$	$65 \times \frac{10}{16}$
$41 \times \frac{8}{16}$	$42 \times \frac{8}{16}$	$43 \times \frac{8}{16}$	$44 \times \frac{8}{16}$	$45 \times \frac{8}{16}$	$46 \times \frac{8}{16}$	$47 \times \frac{8}{16}$	$48 \times \frac{8}{16}$	$49 \times \frac{8}{16}$	$50 \times \frac{8}{16}$	$51 \times \frac{8}{16}$	$52 \times \frac{8}{16}$	$53 \times \frac{8}{16}$
$21 \times \frac{10}{16}$	$22 \times \frac{10}{16}$	$23 \times \frac{10}{16}$	$24 \times \frac{10}{16}$	$25 \times \frac{10}{16}$	$26 \times \frac{10}{16}$	$27 \times \frac{10}{16}$	$28 \times \frac{10}{16}$	$29 \times \frac{10}{16}$	$30 \times \frac{10}{16}$	$31 \times \frac{10}{16}$	$32 \times \frac{10}{16}$	$33 \times \frac{10}{16}$
$21 \times \frac{8}{16}$	$22 \times \frac{8}{16}$	$23 \times \frac{8}{16}$	$24 \times \frac{8}{16}$	$25 \times \frac{8}{16}$	$26 \times \frac{8}{16}$	$27 \times \frac{8}{16}$	$28 \times \frac{8}{16}$	$29 \times \frac{8}{16}$	$30 \times \frac{8}{16}$	$31 \times \frac{8}{16}$	$32 \times \frac{8}{16}$	$33 \times \frac{8}{16}$

11. *Orlop stringer plates* where required to be fitted, to be of the same thickness as the hold beam stringer plates, and three-fourths the breadth of the same.

12. Diagonal tie plates are to be fitted on the beams of all sailing vessels in way of the masts at the deck on which they are wedged, and in addition, where the plating number is 15,000 and above, diagonal tie plates are to be fitted all fore and aft on the upper deck.

13. In sailing vessels whose plating number is under 15,000, and in steam vessels not requiring an iron deck, if *diagonal tie plates* be fitted on the beams in sufficient number, and to the satisfaction of the Surveyor, their breadth as given in the Table may be deducted from the breadth given above for the stringer plates amidships, in which case the stringer plates may be reduced in breadth at the ends of the vessel to three-fourths of their breadth amidships.

14. Tie plates on all tiers of beams to be of the same thickness as the stringer plates of their respective decks.









# IRON VESSELS.

Additions beyond the requirements contained in  
to depth than in Vessels for wh

Proportion of Depths to Length.	ITEMS.	PLATING
		UNDER 10450
Above 11 and not exceeding 12	1 Sheerstrake ... ..	1 Add $\frac{1}{16}$ for $\frac{1}{2}$ length amidships .. ..
	2 Strake below Sheerstrake...	2 .. .. ..
	3 Upper deck Stringer plate .. ..	3 .. .. ..
	4 Middle line Keelson .. ..	4 .. .. ..
	5 Side Keelson .. ..	5 .. .. ..
	6 Bilge Keelson .. ..	6 Add Bulb for $\frac{1}{2}$ length amidships.. ..
	7 Bilge Stringer .. ..	7 .. .. ..
	8 Bilge Plating .. ..	8 One Strake increased $\frac{1}{16}$ for $\frac{1}{2}$ length amidships.. ..
Above 12 and not exceeding 13	1 Sheerstrake ... ..	1 Add $\frac{2}{16}$ for $\frac{3}{4}$ length amidships .. ..
	2 Strake below Sheerstrake...	2 .. .. ..
	3 Upper deck Stringer plate .. ..	3 .. .. ..
	4 Middle line Keelson .. ..	4 .. .. ..
	5 Side Keelson .. ..	5 .. .. ..
	6 Bilge Keelson .. ..	6 Add Bulb for $\frac{2}{3}$ length amidships.. ..
	7 Bilge Stringer... ..	7 .. .. ..
	8 Bilge Plating .. ..	8 Two strakes increased $\frac{1}{16}$ for $\frac{1}{2}$ length amidships.. ..
Above 13 and not exceeding 14	1 Sheerstrake ... ..	1 Add Doubling 18 inches wide for $\frac{2}{3}$ length amidships .. ..
	2 Strake below Sheerstrake...	2 .. .. ..
	3 Upper deck Stringer plate .. ..	3 .. .. ..
	4 Middle line Keelson... ..	4 .. .. ..
	5 Side Keelson .. ..	5 Double Angle Keelson to be fitted in all cases .. ..
	6 Bilge Keelson .. ..	6 Add Bulb for $\frac{2}{3}$ length amidships.. ..
	7 Bilge Stringer... ..	7 Add Bulb for $\frac{1}{2}$ length amidships.. ..
	8 Bilge Plating .. ..	8 Two Strakes increased $\frac{1}{16}$ for $\frac{1}{2}$ length amidships .. ..
Above 14 and not exceeding 15	1 Sheerstrake ... ..	1 Add Doubling 20 inches wide for $\frac{3}{4}$ length amidships .. ..
	2 Strake below Sheerstrake...	2 .. .. ..
	3 Upper deck Stringer plate...	3 .. .. ..
	4 Middle line Keelson... ..	4 .. .. ..
	5 Side Keelson .. ..	5 Double Angle Keelson and Bulb all fore and aft .. ..
	6 Bilge Keelson .. ..	6 Add Bulb for $\frac{2}{3}$ length amidships.. ..
	7 Bilge Stringer .. ..	7 Add Bulb for $\frac{1}{2}$ length & Intercoastal for $\frac{1}{2}$ length amidships.. ..
	8 Bilge Plating .. ..	8 One Strake doubled for $\frac{1}{2}$ length amidships in lieu of Interco
Above 15 and not exceeding 16	1 Sheerstrake ... ..	1 .. .. ..
	2 Strake below Sheerstrake...	2 .. .. ..
	3 Second Strake below Sheerstrake .. ..	3 .. .. ..
	4 Upper deck Stringer plate... ..	4 .. .. ..
	5 Middle line Keelson... ..	5 .. .. ..
	6 Side Keelson .. ..	6 .. .. ..
	7 Bilge Keelson .. ..	7 .. .. ..
	8 Bilge Stringer .. ..	8 .. .. ..
	9 Bilge Plating .. ..	9 .. .. ..

For all Vessels exceeding in length sixteen depths to the Middle Deck, plans must be submitted for the approval of the Committee for giving the vessels sufficient additional strength longitudinally; and all vessels having a length of thirteen depths and above to the Upper Deck are to have a substantial erection extending over the midship half length of the Vessel. See also Section 46.

Where Bulb plates are required they are to be of the size given in Table G 4 for the midship hold beams, or for main deck beams, in vessels with one deck.



les ; for Vessels of greater proportionate length  
the ordinary Scantlings are provided.

# TABLE G 6.

(For Nos. 18700 to 40000 see continuation.)

## NUMBERS.

10450 and under 15500	15500 and under 18700
Add $\frac{1}{16}$ for $\frac{3}{4}$ length amidships .. .. .	1 Add $\frac{1}{16}$ for $\frac{3}{4}$ length amidships .. .. .
.. .. .	2 .. .. .
.. .. .	3 .. .. .
.. .. .	4 .. .. .
.. .. .	5 .. .. .
Add Bulb for $\frac{1}{2}$ length amidships.. .. .	6 Add Bulb for $\frac{1}{2}$ length amidships.. .. .
.. .. .	7 .. .. .
One Strake increased $\frac{1}{16}$ for $\frac{1}{2}$ length amidships .. .. .	8 One Strake increased $\frac{1}{16}$ for $\frac{1}{2}$ length amidships .. .. .
Add $\frac{1}{16}$ for $\frac{3}{4}$ length amidships .. .. .	1 Add $\frac{1}{16}$ for $\frac{3}{4}$ length amidships .. .. .
Add $\frac{1}{16}$ for $\frac{1}{2}$ length amidships .. .. .	2 Add $\frac{1}{16}$ for $\frac{1}{2}$ length amidships .. .. .
.. .. .	3 .. .. .
.. .. .	4 .. .. .
.. .. .	5 .. .. .
Add Bulb for $\frac{3}{8}$ length amidships.. .. .	6 Add Bulb for $\frac{3}{8}$ length amidships.. .. .
.. .. .	7 .. .. .
Two Strakes increased $\frac{1}{16}$ for $\frac{1}{2}$ length amidships .. .. .	8 Two Strakes increased $\frac{1}{16}$ for $\frac{1}{2}$ length amidships .. .. .
Add Doubling 20 inches wide for $\frac{3}{8}$ length amidships.. .. .	1 Add Doubling whole width below stringer for $\frac{3}{8}$ length amids.
.. .. .	2 .. .. .
.. .. .	3 .. .. .
.. .. .	4 .. .. .
.. .. .	5 .. .. .
Add Intercoastal .. .. .	6 Add Bulb for $\frac{3}{8}$ length amidships.. .. .
Add Bulb for $\frac{3}{8}$ length amidships.. .. .	7 Add Intercoastal for $\frac{1}{2}$ length amidships, or .. .. .
Add Bulb for $\frac{1}{2}$ length where no hold beams .. .. .	8 Three Strakes increased $\frac{1}{16}$ for $\frac{1}{2}$ length amidships .. .. .
Two Strakes increased $\frac{1}{16}$ for $\frac{1}{2}$ length amidships .. .. .	
Add Doubling whole width below stringer for $\frac{3}{4}$ length amids.	1 Add Doubling whole width below stringer for $\frac{3}{4}$ length amids.
.. .. .	2 .. .. .
.. .. .	3 Add $\frac{1}{16}$ for $\frac{1}{2}$ length amidships .. .. .
.. .. .	4 .. .. .
Add Intercoastal .. .. .	5 .. .. .
Add Bulb for $\frac{3}{8}$ length amidships.. .. .	6 Add Bulb for $\frac{3}{8}$ length amidships.. .. .
Add Intercoastal for $\frac{1}{2}$ length amidships, or .. .. .	7 Add Intercoastal for $\frac{1}{2}$ length amidships, or .. .. .
One Strake doubled for $\frac{1}{2}$ length amidships .. .. .	8 One Strake doubled for $\frac{1}{2}$ length amidships .. .. .
Add Doubling whole width below stringer for $\frac{3}{4}$ length amids.	1 Add Doubling whole width below stringer for $\frac{3}{4}$ length amids.
Add $\frac{1}{16}$ for $\frac{1}{2}$ length amidships .. .. .	2 Add $\frac{1}{16}$ for $\frac{1}{2}$ length amidships .. .. .
.. .. .	3 .. .. .
.. .. .	4 .. .. .
.. .. .	5 .. .. .
Add Intercoastal .. .. .	6 .. .. .
Add Bulb for $\frac{3}{8}$ length amidships.. .. .	7 Add Intercoastal for $\frac{3}{8}$ length amidships .. .. .
Add Intercoastal for $\frac{1}{2}$ length amidships, or .. .. .	8 Add Intercoastal for $\frac{1}{2}$ length amidships, or .. .. .
One Strake doubled for $\frac{1}{2}$ length amidships .. .. .	9 One Strake doubled for $\frac{1}{2}$ length amidships .. .. .

All Vessels, excepting those with an awning deck, whose plating number exceeds 35,000 and exceeding 16 depths in length, taken from the main deck, are to have the whole of the reverse frames extended to the gunwale for half the vessel's length amidships, or a sufficient number of partial bulkheads fitted in the 'tween decks to the approval of the Committee. In the case of awning-decked vessels they are all to extend to the main deck.



# IRON VESSELS.

Additions beyond the requirements contained in the to depth than in Vessels for which

Proportion of Depths to Length.	ITEMS.	PLATING
		18700 and under 26000
Above 11 and not exceeding 12	1 Sheerstrake ... ..	1 Add $\frac{2}{16}$ for $\frac{3}{4}$ length amidships .. ..
	2 Strake below Sheerstrake...	2 .. ..
	3 Upper deck Stringer plate .. ..	3 .. ..
	4 Middle line Keelson ... ..	4 .. ..
	5 Side Keelson ... ..	5 .. ..
	6 Bilge Keelson ... ..	6 Add Bulb for $\frac{3}{8}$ length amidships.. ..
	7 Bilge Stringer ... ..	7 .. ..
	8 Bilge Plating ... ..	8 Two Strakes increased $\frac{1}{16}$ for $\frac{1}{4}$ length amidships .. ..
Above 12 and not exceeding 13	1 Sheerstrake ... ..	1 Add $\frac{2}{16}$ for $\frac{3}{4}$ length amidships .. ..
	2 Strake below Sheerstrake...	2 Add $\frac{2}{16}$ for $\frac{1}{2}$ length amidships .. ..
	3 Upper deck Stringer plate .. ..	3 .. ..
	4 Middle line Keelson ... ..	4 .. ..
	5 Side Keelson ... ..	5 .. ..
	6 Bilge Keelson ... ..	6 Add Bulb for $\frac{3}{8}$ length amidships.. ..
	7 Bilge Stringer ... ..	7 Add Intercoastal for $\frac{1}{2}$ length amidships, or .. ..
	8 Bilge Plating ... ..	8 Three Strakes increased $\frac{1}{16}$ for $\frac{1}{4}$ length amidships .. ..
Above 13 and not exceeding 14	1 Sheerstrake ... ..	1 Add Doubling whole width below Stringer for $\frac{3}{8}$ length amids.
	2 Strake below Sheerstrake...	2 .. ..
	3 Upper deck Stringer plate .. ..	3 Add $\frac{1}{16}$ for $\frac{1}{2}$ length amidships .. ..
	4 Middle line Keelson... ..	4 .. ..
	5 Side Keelson ... ..	5 .. ..
	6 Bilge Keelson ... ..	6 Add Bulb for $\frac{3}{8}$ length amidships.. ..
	7 Bilge Stringer... ..	7 Add Intercoastal for $\frac{1}{2}$ length amidships .. ..
	8 Bilge Plating ... ..	8 .. ..
Above 14 and not exceeding 15	1 Sheerstrake ... ..	1 Add Doubling whole width below Stringer for $\frac{3}{4}$ lengths amids.
	2 Strake below Sheerstrake...	2 .. ..
	3 Upper deck Stringer plate .. ..	3 Add $\frac{2}{16}$ for $\frac{1}{2}$ length amidships .. ..
	4 Middle line Keelson... ..	4 To be $\frac{1}{4}$ deeper than in Table G 3, .. ..
	5 Side Keelson ... ..	5 Add Bulb for $\frac{1}{2}$ length amidships.. ..
	6 Bilge Keelson ... ..	6 Add Bulb for $\frac{3}{8}$ length amidships .. ..
	7 Bilge Stringer ... ..	7 Add Intercoastal for $\frac{1}{2}$ length amidships .. ..
	8 Bilge Plating ... ..	8 .. ..
Above 15 and not exceeding 16	1 Sheerstrake ... ..	1 Add Doubling whole width below Stringer for $\frac{3}{4}$ length amids.
	2 Strake below Sheerstrake...	2 Add Doubling whole width for $\frac{1}{2}$ length amidships .. ..
	3 Second Strake below Sheerstrake .. ..	3 .. ..
	4 Upper deck Stringer Plate .. ..	4 Add $\frac{2}{16}$ for $\frac{1}{2}$ length amidships .. ..
	5 Middle line Keelson... ..	5 To be $\frac{1}{4}$ deeper than in Table G 3. .. ..
	6 Side Keelson ... ..	6 Add Bulb for $\frac{1}{2}$ length amidships.. ..
	7 Bilge Keelson ... ..	7 Add Bulb for $\frac{3}{8}$ length and Intercoastal for $\frac{1}{2}$ length amidships .. ..
	8 Bilge Stringer... ..	8 Add Intercoastal for $\frac{3}{8}$ length amidships .. ..
	9 Bilge Plating ... ..	9 .. ..

(a) Continuous plate Keelson standing on the floors and attached to Intercoastal Keelson plates, having double angles on upper and lower edges of the sizes given in Table G 3, the plate to be of sufficient depth to take the deep flanges of the angles, and to be of the thickness given in Table G 3 for middle line Keelsons.

(b) Continuous plate Keelson standing on the floors and attached to Intercoastal Keelson plates, having double angles on upper and lower edges of the sizes given in Table G 3, the plate to be three-fourths the depth given in Table G 3 for middle line Keelsons, and of the same thickness.



Rules ; for Vessels of greater proportionate length  
the ordinary Scantlings are provided.

TABLE **G 6.**  
(continued.)

NUMBERS.

26000 and under 35000

35000 and under 40000

- 1 Add  $\frac{2}{16}$  for  $\frac{3}{4}$  length amidships .. .. .
- 2 Add  $\frac{2}{16}$  for  $\frac{1}{2}$  length amidships .. .. .
- 3 .. .. .
- 4 .. .. .
- 5 Add Bulb for  $\frac{1}{2}$  length amidships.. .. .
- 6 Add Bulb for  $\frac{3}{8}$  length and Intercoastal for  $\frac{1}{2}$  length amidships
- 7 Add Intercoastal for  $\frac{1}{2}$  length amidships.. .. .
- 8 .. .. .

- 1 Add  $\frac{2}{16}$  for  $\frac{3}{4}$  length amidships .. .. .
- 2 Add  $\frac{2}{16}$  for  $\frac{1}{2}$  length amidships .. .. .
- 3 .. .. .
- 4 .. .. .
- 5 Add plate Keelson (**α**) for  $\frac{1}{2}$  length amidships .. .. .
- 6 Add Bulb for  $\frac{3}{8}$  length and Intercoastal for  $\frac{1}{2}$  length amidships
- 7 Add Intercoastal for  $\frac{3}{8}$  length amidships.. .. .
- 8 .. .. .

- 1 Add  $\frac{2}{16}$  for  $\frac{3}{4}$  length amidships .. .. .
- 2 Add  $\frac{2}{16}$  for  $\frac{1}{2}$  length amidships .. .. .
- 3 Add  $\frac{2}{16}$  for  $\frac{3}{8}$  length amidships .. .. .
- 4 .. .. .
- 5 Add Bulb for  $\frac{1}{2}$  length amidships.. .. .
- 6 Add Bulb for  $\frac{3}{8}$  length and Intercoastal for  $\frac{1}{2}$  length amidships
- 7 Add Intercoastal for  $\frac{1}{2}$  length amidships .. .. .
- 8 .. .. .

- 1 Add Doubling whole width below Stringer for  $\frac{3}{4}$  length amids.
- 2 .. .. .
- 3 Add  $\frac{2}{16}$  for  $\frac{3}{8}$  length amidships .. .. .
- 4 .. .. .
- 5 Add plate Keelson (**α**) for  $\frac{1}{2}$  length amidships.. .. .
- 6 Add Bulb for  $\frac{3}{8}$  length and Intercoastal for  $\frac{1}{2}$  length amidships
- 7 Add Intercoastal for  $\frac{3}{8}$  length amidships .. .. .
- 8 .. .. .

- 1 Add Doubling whole width below Stringer for  $\frac{3}{4}$  length amids.
- 2 .. .. .
- 3 Add  $\frac{2}{16}$  for  $\frac{3}{8}$  length amidships .. .. .
- 4 To be  $\frac{1}{4}$  deeper than in Table **G 3.** .. .. .
- 5 Add Bulb for  $\frac{1}{2}$  length amidships.. .. .
- 6 Add Bulb for  $\frac{3}{8}$  length and Intercoastal for  $\frac{1}{2}$  length amidships
- 7 Add Intercoastal for  $\frac{3}{8}$  length amidships .. .. .
- 8 .. .. .

- 1 Add Doubling whole width below Stringer for  $\frac{3}{4}$  length amids.
- 2 Add Doubling whole width for  $\frac{1}{2}$  length amidships .. .. .
- 3 Add  $\frac{2}{16}$  for  $\frac{3}{8}$  length amidships .. .. .
- 4 To be  $\frac{1}{4}$  deeper than in Table **G 3.** .. .. .
- 5 Add plate Keelson (**U**) for  $\frac{1}{2}$  length amidships.. .. .
- 6 Add Bulb for  $\frac{3}{8}$  length and Intercoastal for  $\frac{1}{2}$  length amidships
- 7 Add Intercoastal for  $\frac{3}{8}$  length amidships .. .. .
- 8 .. .. .

- 1 Add Doubling whole width below Stringer for  $\frac{3}{4}$  length amids.
- 2 Add Doubling whole width for  $\frac{1}{2}$  length amidships .. .. .
- 3 Add  $\frac{2}{16}$  for  $\frac{3}{8}$  length amidships .. .. .
- 4 To be  $\frac{1}{4}$  deeper than in Table **G 3.** .. .. .
- 5 Add plate Keelson (**α**) for  $\frac{1}{2}$  length amidships .. .. .
- 6 Add Bulb for  $\frac{3}{8}$  length and Intercoastal for  $\frac{3}{8}$  length amidships
- 7 Add Intercoastal for  $\frac{3}{8}$  length amidships .. .. .
- 8 .. .. .

- 1 Add Doubling whole width below Stringer for  $\frac{3}{4}$  length amids.
- 2 Add Doubling whole width for  $\frac{1}{2}$  length amidships .. .. .
- 3 Add Doubling 42 inches wide for  $\frac{3}{8}$  length amidships.. .. .
- 4 To be  $\frac{1}{4}$  deeper than in Table **G 3.** .. .. .
- 5 Add plate Keelson (**U**) for  $\frac{1}{2}$  length amidships.. .. .
- 6 Add plate Keelson (**α**) for  $\frac{1}{2}$  length & Intl. for  $\frac{3}{8}$  length amids.
- 7 Add Intercoastal for  $\frac{3}{8}$  length amidships .. .. .
- 8 .. .. .

- 1 Add Doubling whole width below Stringer for  $\frac{3}{4}$  length amids.
- 2 Add Doubling whole width for  $\frac{3}{8}$  length amidships .. .. .
- 3 .. .. .
- 4 Add Doubling 40 inches wide for  $\frac{1}{2}$  length amidships.. .. .
- 5 To be  $\frac{1}{4}$  deeper than in Table **G 3.** .. .. .
- 6 Add plate Keelson (**U**) for  $\frac{1}{2}$  length amidships .. .. .
- 7 Add Bulb for  $\frac{3}{8}$  length and Intercoastal for  $\frac{3}{8}$  length amidships
- 8 Add Intercoastal for  $\frac{3}{8}$  length amidships .. .. .
- 9 .. .. .

- 1 Add Doubling whole width below Stringer for  $\frac{3}{4}$  length amids.
- 2 Add Doubling whole width for  $\frac{3}{8}$  length amidships .. .. .
- 3 Add Doubling whole width for  $\frac{1}{2}$  length amidships .. .. .
- 4 Add Doubling 50 inches wide for  $\frac{3}{8}$  length amidships.. .. .
- 5 To be  $\frac{1}{4}$  deeper than in Table **G 3.** .. .. .
- 6 Add plate Keelson (**U**) for  $\frac{1}{2}$  length amidships.. .. .
- 7 Add plate Keelson (**U**) for  $\frac{1}{2}$  length and Intl. for  $\frac{3}{8}$  length amids.
- 8 Add Intercoastal for  $\frac{3}{8}$  length amidships .. .. .
- 9 .. .. .



# TABLE G (continued).

for Vessels of greater proportionate length

NUMBERS.

35000 and under 40000

28000 and under 35000

1. Add $\frac{1}{2}$ for length amidships	1. Add $\frac{1}{2}$ for length amidships
2. Add $\frac{1}{4}$ for length amidships	2. Add $\frac{1}{4}$ for length amidships
3. Add $\frac{1}{8}$ for length amidships	3. Add $\frac{1}{8}$ for length amidships
4. Add plate Keelson (or) for length amidships	4. Add plate Keelson (or) for length amidships
5. Add Bulk for length and intercostal for length amidships	5. Add Bulk for length and intercostal for length amidships
6. Add Bulk for length and intercostal for length amidships	6. Add Bulk for length and intercostal for length amidships
7. Add intercostal for length amidships	7. Add intercostal for length amidships
8. Add intercostal for length amidships	8. Add intercostal for length amidships
1. Add Doubling whole width below stringer for length amidships	1. Add Doubling whole width below stringer for length amidships
2. Add $\frac{1}{2}$ for length amidships	2. Add $\frac{1}{2}$ for length amidships
3. Add $\frac{1}{4}$ for length amidships	3. Add $\frac{1}{4}$ for length amidships
4. To be deeper than in Table G 3.	4. To be deeper than in Table G 3.
5. Add plate Keelson (or) for length amidships	5. Add plate Keelson (or) for length amidships
6. Add Bulk for length and intercostal for length amidships	6. Add Bulk for length and intercostal for length amidships
7. Add intercostal for length amidships	7. Add intercostal for length amidships
8. Add intercostal for length amidships	8. Add intercostal for length amidships
1. Add Doubling whole width below stringer for length amidships	1. Add Doubling whole width below stringer for length amidships
2. Add Doubling whole width for length amidships	2. Add Doubling whole width for length amidships
3. Add Doubling 42 inches wide for length amidships	3. Add Doubling 42 inches wide for length amidships
4. To be deeper than in Table G 3.	4. To be deeper than in Table G 3.
5. Add plate Keelson (or) for length amidships	5. Add plate Keelson (or) for length amidships
6. Add Bulk for length and intercostal for length amidships	6. Add Bulk for length and intercostal for length amidships
7. Add intercostal for length amidships	7. Add intercostal for length amidships
8. Add intercostal for length amidships	8. Add intercostal for length amidships
1. Add Doubling whole width below stringer for length amidships	1. Add Doubling whole width below stringer for length amidships
2. Add Doubling whole width for length amidships	2. Add Doubling whole width for length amidships
3. Add Doubling 30 inches wide for length amidships	3. Add Doubling 30 inches wide for length amidships
4. To be deeper than in Table G 3.	4. To be deeper than in Table G 3.
5. Add plate Keelson (or) for length amidships	5. Add plate Keelson (or) for length amidships
6. Add Bulk for length and intercostal for length amidships	6. Add Bulk for length and intercostal for length amidships
7. Add intercostal for length amidships	7. Add intercostal for length amidships
8. Add intercostal for length amidships	8. Add intercostal for length amidships
1. Add Doubling whole width below stringer for length amidships	1. Add Doubling whole width below stringer for length amidships
2. Add Doubling whole width for length amidships	2. Add Doubling whole width for length amidships
3. Add Doubling 20 inches wide for length amidships	3. Add Doubling 20 inches wide for length amidships
4. To be deeper than in Table G 3.	4. To be deeper than in Table G 3.
5. Add plate Keelson (or) for length amidships	5. Add plate Keelson (or) for length amidships
6. Add Bulk for length and intercostal for length amidships	6. Add Bulk for length and intercostal for length amidships
7. Add intercostal for length amidships	7. Add intercostal for length amidships
8. Add intercostal for length amidships	8. Add intercostal for length amidships

8+3+8+12

8+3+8+12



Table of Scantlings for DOUBLE BOTTOMS CONSTRUCTED ON THE CELLULAR SYSTEM.

PLATING NUMBER FOR REGULATING SCANTLINGS. (See Section 2.)	Centre Girder. — Depth above Top of Keel and Thickness.	Thick- ness of Side Girders	Number of Side Girders (exclusive of Margin Plates) on each side, with Floors at alternate Frames.	Margin Plate. — Depth (exclusive of Flange) and Thickness.	Thickness of Inner Bottom Plating.				Thick- ness of Brack't or Floor Plates.	DIMENSIONS OF ANGLE BARS.		
					Middle Line Strake. (b)		In Engine and Boiler Space.	In Holds.		On Centre Girder. (a)	On Margin Plates.	On Side Girders, Intermediate, and Vertical Angle Bars.
					Amid- ships.	Ends.						
	inches.	inches.		inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	
Under 11,000	$32 \times \frac{8}{16}$	$\frac{5}{16}$	2	$18 \times \frac{6}{16}$	$\frac{6}{16}$	$\frac{6}{16}$	$\frac{6}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	$3 \times 3 \times \frac{6}{16}$	$3 \times 2\frac{1}{2} \times \frac{5}{16}$
11,000 and under 13,000	$33 \times \frac{8}{16}$	$\frac{6}{16}$	2	$19 \times \frac{7}{16}$	$\frac{7}{16}$	$\frac{6}{16}$	$\frac{7}{16}$	$\frac{6}{16}$	$\frac{6}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	$3 \times 2\frac{1}{2} \times \frac{6}{16}$
13,000 and under 15,000	$34 \times \frac{8}{16}$	$\frac{6}{16}$	3	$20 \times \frac{7}{16}$	$\frac{7}{16}$	$\frac{6}{16}$	$\frac{7}{16}$	$\frac{6}{16}$	$\frac{6}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	$3 \times 3 \times \frac{6}{16}$
15,000 and under 18,000	$35 \times \frac{9}{16}$	$\frac{6}{16}$	3	$21 \times \frac{7}{16}$	$\frac{8}{16}$	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{6}{16}$	$\frac{6}{16}$	$4 \times 4 \times \frac{8}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	$3 \times 3 \times \frac{6}{16}$
18,000 and under 21,000	$36 \times \frac{9}{16}$	$\frac{6}{16}$	3	$22 \times \frac{7}{16}$	$\frac{8}{16}$	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{6}{16}$	$\frac{6}{16}$	$4 \times 4 \times \frac{9}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$	$3 \times 3 \times \frac{7}{16}$
21,000 and under 24,000	$38 \times \frac{10}{16}$	$\frac{6}{16}$	3	$24 \times \frac{7}{16}$	$\frac{9}{16}$	$\frac{8}{16}$	$\frac{7}{16}$	$\frac{6}{16}$	$\frac{6}{16}$	$4 \times 4 \times \frac{9}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$
24,000 and under 28,000	$40 \times \frac{10}{16}$	$\frac{7}{16}$	3	$26 \times \frac{7}{16}$	$\frac{9}{16}$	$\frac{8}{16}$	$\frac{7}{16}$	$\frac{6}{16}$	$\frac{7}{16}$	$4 \times 4 \times \frac{9}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$
28,000 and under 33,000	$42 \times \frac{10}{16}$	$\frac{7}{16}$	3	$28 \times \frac{8}{16}$	$\frac{9}{16}$	$\frac{8}{16}$	$\frac{8}{16}$	$\frac{7}{16}$	$\frac{7}{16}$	$4 \times 4 \times \frac{9}{16}$	$4 \times 4 \times \frac{9}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{16}$
33,000 and under 38,000	$44 \times \frac{10}{16}$	$\frac{7}{16}$	4	$30 \times \frac{8}{16}$	$\frac{10}{16}$	$\frac{8}{16}$	$\frac{8}{16}$	$\frac{7}{16}$	$\frac{7}{16}$	$4 \times 4 \times \frac{9}{16}$	$4 \times 4 \times \frac{9}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{16}$
38,000 and under 44,000	$46 \times \frac{10}{16}$	$\frac{8 \text{ to } 7}{16}$	4	$32 \times \frac{9}{16}$	$\frac{10}{16}$	$\frac{8}{16}$	$\frac{8}{16}$	$\frac{8 \text{ to } 7}{16}$	$\frac{8 \text{ to } 7}{16}$	$4 \times 4 \times \frac{10}{16}$	$4 \times 4 \times \frac{10}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{9}{16}$
44,000 and under 51,000	$48 \times \frac{11}{16}$	$\frac{8}{16}$	4	$34 \times \frac{10}{16}$	$\frac{11}{16}$	$\frac{9}{16}$	$\frac{8}{16}$	$\frac{8}{16}$	$\frac{8}{16}$	$4 \times 4 \times \frac{10}{16}$	$4 \times 4 \times \frac{10}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{9}{16}$

(a) Where Flat Plate Keels are adopted, the Angles connecting the same to the centre Plate are to be of the size required for Middle Line Keelsons in Table G 3.

(b) The breadth of the Middle Line Strake of the inner bottom plating to be not less than that given for Garboard Strakes in Table G 2.

The Floor plates and other parts of the inner bottom in the Boiler space to be  $\frac{1}{16}$ th of an inch thicker than given in the above Table.





# IRON VESSELS.

## TABLE G 8.

Showing diameters and spacing of Rivets and breadths of Straps, Lapped Butts and Edge Laps.

	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.
Thickness of PLATES .....	$\frac{5}{16}$	$\frac{6}{16}$	$\frac{6 \& 7}{16}$	$\frac{7}{16}$	$\frac{8}{16}$	$\frac{9}{16}$	$\frac{9 \& 10}{16}$	$\frac{10}{16}$	$\frac{11}{16}$	$\frac{12}{16}$	$\frac{12 \& 13}{16}$	$\frac{13}{16}$	$\frac{14}{16}$	$\frac{15}{16}$	$\frac{16}{16}$
			alternately.				alternately.	(7)			alternately.				
Diameter of RIVETS.....	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	1	1	1	$1\frac{1}{8}$	$1\frac{1}{8}$
Breadth of TREBLE rivetted STRAPS .....	...	...	...	...	$14\frac{1}{4}$	$14\frac{1}{4}$	$14\frac{1}{4}$	$16\frac{3}{4}$	$16\frac{3}{4}$	$16\frac{3}{4}$	19	19	19	$21\frac{1}{4}$	$21\frac{1}{4}$
" " DOUBLE " " .....	8	8	$9\frac{3}{4}$	$9\frac{3}{4}$	$9\frac{3}{4}$	$9\frac{3}{4}$	$9\frac{3}{4}$	$11\frac{1}{4}$	$11\frac{1}{4}$	$11\frac{1}{4}$	...	...	...	...	...
" " TREBLE " BUTT LAPS.....	...	...	...	...	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	9	9	9	$10\frac{1}{2}$	$10\frac{1}{2}$	$10\frac{1}{2}$	...	...
" " DOUBLE " " .....	$4\frac{1}{4}$	$4\frac{1}{4}$	5	5	5	5	5	6	6	6	...	...	...	...	...
" " DOUBLE " EDGE LAPS.....	$3\frac{3}{4}$	$3\frac{3}{4}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{4}$	$5\frac{1}{4}$	$5\frac{1}{4}$	6	6	6	$6\frac{3}{4}$	$6\frac{3}{4}$
" " SINGLE " " .....	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	...	...	...	...	...	...	...	...	...	...
MAXIMUM Spacing In BUTTS of outside plating	$2\frac{1}{2}$	$2\frac{1}{2}$	3	3	3	3	3	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	4	4	4	$4\frac{1}{2}$	$4\frac{1}{2}$
of Rivets from In EDGES (forward and aft)	$2\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{8}$	4	4	4	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	5	5
centre to centre In FRAMES .....	5	5	6	6	6	6	6	7	7	7	8	8	8	...	...

### Minimum number of Rivets in edges of Plating between Frames AMIDSHIPS.

	NUMBER OF RIVETS IN EACH ROW.														
DIAMETER OF RIVETS .....	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.
	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	1	1	1	$1\frac{1}{8}$	$1\frac{1}{8}$
Spacing of FRAMES ..... 20 ins. ....	7	7	5	5	5	5	...	...	...	...	...	...	...	...	...
" " " ..... 21 " .....	...	7	6	6	6	6	6	5	5	...	...	...	...	...	...
" " " ..... 22 " .....	...	...	6	6	6	6	6	5	5	5	...	...	...	...	...
" " " ..... 23 " .....	...	...	6	6	6	6	6	5	5	5	5	5	5	...	...
" " " ..... 24 " .....	...	...	7	7	7	7	7	6	6	6	5	5	5	...	...
" " " ..... 25 " .....	...	...	...	...	...	...	...	6	6	6	5	5	5	...	...
" " " ..... 26 " .....	...	...	...	...	...	...	...	...	...	...	...	5	5	5	5

Where the fore and aft flange of the frame does not exceed 3 inches, the rivets attaching the outside Plating thereto should not exceed  $\frac{7}{8}$  inch in diameter, and where it is  $3\frac{1}{2}$  inches wide, they should not exceed 1 inch in diameter.

(b) Where stringer and tie plates are  $\frac{1}{8}$  of an inch thick, they should be secured to the beams with  $\frac{3}{4}$  of an inch rivets. RIVETS to be  $\frac{1}{4}$  of an inch larger in diameter in STEM, STERN FRAME, and KEEL, but in no case need these exceed  $1\frac{1}{4}$  inches in diameter, and to be spaced 5 diameters apart.

RIVETS in RUDDER to be of not less size than required for the upper edge of garboard strake amidships, spaced not more than 5 diameters apart.

RIVETS connecting flat KEEL PLATES and the fore and aft ANGLES to be spaced not more than 5 diameters apart.

RIVETS in the BUTTS of deck plating to be spaced 4 diameters, and in the edges 4 to  $4\frac{1}{2}$  diameters apart.

RIVETS in the BUTTS and EDGES of inner bottom plating, and in butts of girders to be spaced not more than 4 diameters apart.

RIVETS in the LANDS and BUTTS of mast plates to be spaced 5 diameters apart.

Lloyd's Register of Shipping, 2, White Lion Court, Cornhill, London, E.C., 1st October, 1891.



RIVETS in the LANDS and BUTTS of main plates to be spaced 5 diameters apart.  
RIVETS in the BUTTS of deck plating to be spaced 4 diameters, and in the edges 3 to 4 diameters apart.  
RIVETS connecting the KEEL PLATES and the fore and aft ANGLE to be spaced not less than 5 diameters apart.  
RIVETS in RUDDER to be of not less size than required for the upper edge of garboard strake amidships, spaced to exceed  $1\frac{1}{4}$  inches in diameter, and to be spaced 5 diameters apart.  
(c) Where strakes and the plates are  $\frac{1}{2}$  of an inch thick they should be secured to the beams with 1 of an inch rivets. RIVETS to be  $\frac{1}{2}$  of an inch larger in diameter in STEEL, STERN FRAME, and KEEL, but in no case need exceed  $1\frac{1}{4}$  inches in diameter, and to be spaced 5 diameters apart.

DIAMETER OF RIVETS	NUMBER OF RIVETS IN EACH ROW											
	1	1	1	1	1	1	1	1	1	1	1	1
20 in.	7	7	7	7	7	7	7	7	7	7	7	7
21	7	7	7	7	7	7	7	7	7	7	7	7
22	7	7	7	7	7	7	7	7	7	7	7	7
23	7	7	7	7	7	7	7	7	7	7	7	7
24	7	7	7	7	7	7	7	7	7	7	7	7
25	7	7	7	7	7	7	7	7	7	7	7	7
26	7	7	7	7	7	7	7	7	7	7	7	7
27	7	7	7	7	7	7	7	7	7	7	7	7
28	7	7	7	7	7	7	7	7	7	7	7	7
29	7	7	7	7	7	7	7	7	7	7	7	7
30	7	7	7	7	7	7	7	7	7	7	7	7

Minimum number of Rivets in edges of Plating between Frames AMIDSHIPS.

RIVETS in BUTTS of outside plating	RIVETS from IN EDGES (forward and aft)	MINIMUM SPACING in BUTTS of outside plating											
		1	1	1	1	1	1	1	1	1	1	1	1
20 in.	5	5	5	5	5	5	5	5	5	5	5	5	5
21	5	5	5	5	5	5	5	5	5	5	5	5	5
22	5	5	5	5	5	5	5	5	5	5	5	5	5
23	5	5	5	5	5	5	5	5	5	5	5	5	5
24	5	5	5	5	5	5	5	5	5	5	5	5	5
25	5	5	5	5	5	5	5	5	5	5	5	5	5
26	5	5	5	5	5	5	5	5	5	5	5	5	5
27	5	5	5	5	5	5	5	5	5	5	5	5	5
28	5	5	5	5	5	5	5	5	5	5	5	5	5
29	5	5	5	5	5	5	5	5	5	5	5	5	5
30	5	5	5	5	5	5	5	5	5	5	5	5	5





IRON AND STEEL MASTS.

EXTREME LENGTH (See Footnote).		PARTNERS.				HEEL.				HOUNDS.				HEAD.				Sizes of Angle Bars in Masts.	
		Diam.		Thickness.		Diam.		Thickness.		Diam.		Thickness.		Diam.		Thickness.			
				Iron.	Steel.			Iron.	Steel.			Iron.	Steel.			Iron.	Steel.	Iron.	Steel.
Two Plates in the Round.	Ft.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	
	48	16	$\frac{5}{16}$	$\frac{6}{20}$	13	$\frac{4}{16}$	$\frac{5}{20}$	$13\frac{1}{2}$	$\frac{4}{16}$	$\frac{5}{20}$	11	$\frac{3}{16}$	$\frac{3}{16}$	...	...				
	51	17	$\frac{5}{16}$	$\frac{6}{20}$	$13\frac{1}{2}$	$\frac{4}{16}$	$\frac{5}{20}$	14	$\frac{4}{16}$	$\frac{5}{20}$	$11\frac{1}{2}$	$\frac{4}{16}$	$\frac{5}{20}$	...	...				
	54	18	$\frac{5}{16}$	$\frac{6}{20}$	14	$\frac{4}{16}$	$\frac{5}{20}$	15	$\frac{4}{16}$	$\frac{5}{20}$	12	$\frac{4}{16}$	$\frac{5}{20}$	...	...				
	57	19	$\frac{6}{16}$	$\frac{7}{20}$	15	$\frac{5}{16}$	$\frac{6}{20}$	$15\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$	$12\frac{1}{2}$	$\frac{4}{16}$	$\frac{5}{20}$	...	...				
	60	20	$\frac{6}{16}$	$\frac{7}{20}$	16	$\frac{5}{16}$	$\frac{6}{20}$	$16\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$	$13\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$	...	...				
	63	21	$\frac{6}{16}$	$\frac{7}{20}$	$16\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$	$17\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$	14	$\frac{5}{16}$	$\frac{6}{20}$	...	...				
	66	22	$\frac{6}{16}$	$\frac{7}{20}$	17	$\frac{5}{16}$	$\frac{6}{20}$	$18\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$	$14\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$	...	...				
	69	23	$\frac{6}{16}$	$\frac{7}{20}$	18	$\frac{5}{16}$	$\frac{6}{20}$	19	$\frac{5}{16}$	$\frac{6}{20}$	$15\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$	...	...				
	72	24	$\frac{6}{16}$	$\frac{7}{20}$	19	$\frac{5}{16}$	$\frac{6}{20}$	20	$\frac{5}{16}$	$\frac{6}{20}$	16	$\frac{5}{16}$	$\frac{6}{20}$	...	...				
Three Plates in the Round.	75	25	$\frac{7}{16}$	$\frac{8}{20}$	$19\frac{1}{2}$	$\frac{6}{16}$	$\frac{7}{20}$	21	$\frac{6}{16}$	$\frac{7}{20}$	$16\frac{1}{2}$	$\frac{6}{16}$	$\frac{7}{20}$	...	...				
	78	26	$\frac{7}{16}$	$\frac{8}{20}$	20	$\frac{6}{16}$	$\frac{7}{20}$	$21\frac{1}{2}$	$\frac{6}{16}$	$\frac{7}{20}$	$17\frac{1}{2}$	$\frac{6}{16}$	$\frac{7}{20}$	...	...				
	81	27	$\frac{8}{16}$	$\frac{9}{20}$	21	$\frac{6}{16}$	$\frac{7}{20}$	$22\frac{1}{2}$	$\frac{6}{16}$	$\frac{7}{20}$	18	$\frac{6}{16}$	$\frac{7}{20}$	...	...				
	84	28	$\frac{8}{16}$	$\frac{9}{20}$	22	$\frac{6}{16}$	$\frac{7}{20}$	23	$\frac{6}{16}$	$\frac{7}{20}$	$18\frac{1}{2}$	$\frac{6}{16}$	$\frac{7}{20}$	$3\frac{1}{2} \times 3 \times \frac{7}{16}$	$3\frac{1}{2} \times 3 \times \frac{8}{20}$				
	87	29	$\frac{8}{16}$	$\frac{9}{20}$	$22\frac{1}{2}$	$\frac{6}{16}$	$\frac{7}{20}$	24	$\frac{6}{16}$	$\frac{7}{20}$	$19\frac{1}{2}$	$\frac{6}{16}$	$\frac{7}{20}$	$4 \times 3 \times \frac{7}{16}$	$4 \times 3 \times \frac{8}{20}$				
	90	30	$\frac{8}{16}$	$\frac{9}{20}$	23	$\frac{7}{16}$	$\frac{8}{20}$	25	$\frac{7}{16}$	$\frac{8}{20}$	20	$\frac{6}{16}$	$\frac{7}{20}$	$4 \times 3 \times \frac{8}{16}$	$4 \times 3 \times \frac{9}{20}$				
	93	31	$\frac{9}{16}$	$\frac{10}{20}$	24	$\frac{7}{16}$	$\frac{8}{20}$	26	$\frac{7}{16}$	$\frac{8}{20}$	$20\frac{1}{2}$	$\frac{6}{16}$	$\frac{7}{20}$	$4\frac{1}{2} \times 3 \times \frac{8}{16}$	$4\frac{1}{2} \times 3 \times \frac{9}{20}$				
96	32	$\frac{9}{16}$	$\frac{10}{20}$	25	$\frac{7}{16}$	$\frac{8}{20}$	$26\frac{1}{2}$	$\frac{7}{16}$	$\frac{8}{20}$	21	$\frac{6}{16}$	$\frac{7}{20}$	$5 \times 3 \times \frac{8}{16}$	$5 \times 3 \times \frac{9}{20}$					

FOOTNOTE.—The length for regulating the scantlings of the mast

RULES FOR THE CONSTRUCTION OF IRON

1. If Iron be used in the construction of masts, bowsprits, and yards, it is to be of good malleable quality quite free from surface or other defects, and to stand a tensile strain of 20 tons to the square inch and the following bending tests when cold without fracture:—

THICKNESS OF PLATES	TO BEND COLD THROUGH AN ANGLE OF	
	With the Grain.	Across the Grain.
$\frac{9}{16}$	25°	8°
$\frac{8}{16}$	30°	11°
$\frac{7}{16}$	37°	13°
$\frac{6}{16}$	47°	15°
$\frac{5}{16}$	55°	17°
$\frac{4}{16}$	65°	20°
$\frac{3}{16}$	70°	25°

2. The plates to be bent over a slab, the corner of which should be rounded with a radius of half an inch.

3. If Steel be adopted it is to be of the quality required for ship plates and subjected to the same tests.

4. LOWER MASTS.—The plating to be of the thickness, and the plates arranged as in the Table. The seams to be double riveted; in masts of less length than 84 feet, the edges may be single riveted provided angle bars be fitted to the satisfaction of the Committee. The butts below the mast partners in masts, and those inside the wedging of bowsprits, might be double riveted, the remainder should be treble riveted.

5. The buttstraps in all cases should be  $\frac{1}{16}$  of an inch thicker than the plates they connect, in iron masts; in steel masts the buttstraps should be  $\frac{3}{16}$  of an inch thicker than the plates in double riveted butts and  $\frac{3}{8}$  thicker in treble riveted butts. The buttstraps would be better to be fitted on the outside of the masts and bowsprit.

6. The mast and bowsprit plates should be doubled all round in way of the wedging, or otherwise efficiently strengthened; where masts are wedged at the lower deck, the doubling should extend from below the lower deck to above the upper deck.

7. The heels of all masts and their steps should be efficiently strengthened. The cheeks of masts should be stiffened by angles or cope iron on their foremost edges; or by some other approved plan.

8. Where two plates in the round are adopted instead of three, the iron is to be of such superior quality as to admit of its being bent to the required form, without being unduly heated and without fracture, and in all such cases the masts should be additionally stiffened by 3 angles as provided for in the Tables.



## IRON AND STEEL BOWSPRITS.

CHEEKS.												LENGTH OUTSIDE BED.	IRON AND STEEL BOWSPRITS.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Th'kn'ss of Plate.		Sizes of Angle Bar.											BED.			HEEL.			CAP.			Sizes of Angle Bar.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
		Iron.					Steel.						Diam.	Th'kn'ss		Diam.	Th'kn'ss		Diam.	Th'kn'ss		Iron.			Steel.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
Inn.	Stl.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.			ins.	ins.		ins.	ins.		ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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14	16 <sup>1</sup> / <sub>2</sub>	17 <sup>1</sup> / <sub>2</sub>	19	20	21 <sup>1</sup> / <sub>2</sub>	23	24 <sup>1</sup> / <sub>2</sub>	25 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	28	29			30	31 <sup>1</sup> / <sub>2</sub>		33	14		15	16	17	18	19	20	21	22	23	24	25																								26	27	12	12 <sup>1</sup> / <sub>2</sub>	13	14	15	16	16 <sup>1</sup> / <sub>2</sub>	17 <sup>1</sup> / <sub>2</sub>	18 <sup>1</sup> / <sub>2</sub>	19	20	21	21 <sup>1</sup> / <sub>2</sub>	22	2 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub>	3	3	3	3	3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	4	4	4 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>2</sub>	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

to be taken, in all cases, from the cap to the top of the keelson.

## AND STEEL MASTS, BOWSPRITS, AND YARDS.

9. All masts of 84 feet length and above, to be fitted with angles properly shifted and extending the whole length of the mast. If the plates be arranged as described in the Tables, there should be an angle bar fitted to each plate in the round, of the size given in the Table.

10. All bowsprits exceeding 28 inches in diameter should have a vertical diaphragm plate extending from within the wedging to the gammoning, connected by continuous single angle bars to the upper and lower parts of the bowsprit, and two additional angle bars of the size given in the Table; and bowsprits 28 inches in diameter and under, to have an angle bar at the centre of each plate extending the whole length of the bowsprit.

11. The diameter of the lower masts at the cap to be in no case less than that of the topmast at this place, or of the lower topsail yard.

12. The attention of the Surveyors is to be specially directed to the fittings connected with the masts and rigging, in order to ensure the workmanship, material, and sizes of the same being efficient.

13. The mizenmasts for barques may be reduced one-fifth in diameter from that given in the Table, and the plating to be not less than the thickness corresponding to the diameters.

14. Where a Steamer is intended to be fitted with masts or a bowsprit for auxiliary purposes, they may be one-eighth less in diameter than prescribed by Table; and when a mast of a steamer is to carry fore and aft sail only, the diameter may be one-fifth less than given in the Table. The seams of these masts may be single riveted.

15. When pole masts are fitted, the length of the lower mast, in determining the diameter and thickness of plating, should be taken from the heel to the cap band, so as to include the head, as in an ordinary mast; and in sailing vessels these masts to be additionally strengthened by angles from below the lower yard to the topmast cap, or compensating strength furnished. The cheek plates in pole masts may be of the same thickness as the mast plates at the hounds.

16. The eye-bolts, hoops, cleats and bands, are to be of the best description of wrought iron.

17. Any deviations from these Rules and Tables must be submitted for the consideration of the Committee.









# Sizes and Scantlings for YARDS and TOPMASTS of SAILING VESSELS

## YARDS.

Length Cleated.	Centre.			First Quarter.			Second Quarter.			Third Quarter.			Ends at Cleats.		
	Diameter.	Thickness.		Diameter.	Thickness.		Diameter.	Thickness.		Diameter.	Thickness.		Diameter.	Thickness.	
		Iron.	Steel.		Iron.	Steel.		Iron.	Steel.		Iron.	Steel.			
Feet.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	
32	8	$\frac{3}{16}$	$\frac{3}{16}$	$7\frac{7}{8}$	$\frac{3}{16}$	$\frac{3}{16}$	$7\frac{1}{4}$	$\frac{3}{16}$	$\frac{3}{16}$	6	$\frac{3}{16}$	$\frac{3}{16}$	4	$\frac{2}{16}$	$\frac{2}{16}$
36	9	$\frac{3}{16}$	$\frac{3}{16}$	$8\frac{3}{4}$	$\frac{3}{16}$	$\frac{3}{16}$	$8\frac{1}{8}$	$\frac{3}{16}$	$\frac{3}{16}$	$6\frac{3}{4}$	$\frac{3}{16}$	$\frac{3}{16}$	$4\frac{1}{2}$	$\frac{2}{16}$	$\frac{2}{16}$
40	10	$\frac{3}{16}$	$\frac{3}{16}$	$9\frac{3}{4}$	$\frac{3}{16}$	$\frac{3}{16}$	9	$\frac{3}{16}$	$\frac{3}{16}$	$7\frac{1}{2}$	$\frac{3}{16}$	$\frac{3}{16}$	5	$\frac{2}{16}$	$\frac{2}{16}$
44	11	$\frac{3}{16}$	$\frac{3}{16}$	$10\frac{3}{4}$	$\frac{3}{16}$	$\frac{3}{16}$	10	$\frac{3}{16}$	$\frac{3}{16}$	$8\frac{1}{4}$	$\frac{3}{16}$	$\frac{3}{16}$	$5\frac{1}{2}$	$\frac{2}{16}$	$\frac{2}{16}$
48	12	$\frac{4}{16}$	$\frac{5}{20}$	$11\frac{3}{4}$	$\frac{4}{16}$	$\frac{5}{20}$	$10\frac{3}{4}$	$\frac{3}{16}$	$\frac{3}{16}$	9	$\frac{3}{16}$	$\frac{3}{16}$	6	$\frac{2}{16}$	$\frac{2}{16}$
52	13	$\frac{4}{16}$	$\frac{5}{20}$	$12\frac{5}{8}$	$\frac{4}{16}$	$\frac{5}{20}$	$11\frac{3}{4}$	$\frac{3}{16}$	$\frac{3}{16}$	$9\frac{3}{4}$	$\frac{3}{16}$	$\frac{3}{16}$	$6\frac{1}{2}$	$\frac{2}{16}$	$\frac{2}{16}$
56	14	$\frac{4}{16}$	$\frac{5}{20}$	$13\frac{5}{8}$	$\frac{4}{16}$	$\frac{5}{20}$	$12\frac{5}{8}$	$\frac{4}{16}$	$\frac{5}{20}$	$10\frac{1}{2}$	$\frac{3}{16}$	$\frac{3}{16}$	7	$\frac{2}{16}$	$\frac{2}{16}$
60	15	$\frac{4}{16}$	$\frac{5}{20}$	$14\frac{5}{8}$	$\frac{4}{16}$	$\frac{5}{20}$	$13\frac{1}{2}$	$\frac{4}{16}$	$\frac{5}{20}$	$11\frac{1}{4}$	$\frac{3}{16}$	$\frac{3}{16}$	$7\frac{1}{2}$	$\frac{2}{16}$	$\frac{2}{16}$
64	16	$\frac{5}{16}$	$\frac{6}{20}$	$15\frac{5}{8}$	$\frac{5}{16}$	$\frac{6}{20}$	$14\frac{3}{8}$	$\frac{5}{16}$	$\frac{6}{20}$	12	$\frac{4}{16}$	$\frac{5}{20}$	8	$\frac{3}{16}$	$\frac{3}{16}$
68	17	$\frac{5}{16}$	$\frac{6}{20}$	$16\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$	$15\frac{1}{4}$	$\frac{5}{16}$	$\frac{6}{20}$	$12\frac{3}{4}$	$\frac{4}{16}$	$\frac{5}{20}$	$8\frac{1}{2}$	$\frac{3}{16}$	$\frac{3}{16}$
72	18	$\frac{5}{16}$	$\frac{6}{20}$	$17\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$	$16\frac{1}{4}$	$\frac{5}{16}$	$\frac{6}{20}$	$13\frac{1}{2}$	$\frac{4}{16}$	$\frac{5}{20}$	9	$\frac{3}{16}$	$\frac{3}{16}$
76	19	$\frac{6}{16}$	$\frac{7}{20}$	$18\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$	$17\frac{1}{8}$	$\frac{5}{16}$	$\frac{6}{20}$	$14\frac{1}{4}$	$\frac{4}{16}$	$\frac{5}{20}$	$9\frac{1}{2}$	$\frac{3}{16}$	$\frac{3}{16}$
80	20	$\frac{6}{16}$	$\frac{7}{20}$	$19\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$	18	$\frac{5}{16}$	$\frac{6}{20}$	15	$\frac{4}{16}$	$\frac{5}{20}$	10	$\frac{3}{16}$	$\frac{3}{16}$
84	21	$\frac{7}{16}$	$\frac{8}{20}$	$20\frac{1}{2}$	$\frac{6}{16}$	$\frac{7}{20}$	19	$\frac{5}{16}$	$\frac{6}{20}$	$15\frac{3}{4}$	$\frac{5}{16}$	$\frac{6}{20}$	$10\frac{1}{2}$	$\frac{4}{16}$	$\frac{5}{20}$
88	22	$\frac{7}{16}$	$\frac{8}{20}$	$21\frac{1}{2}$	$\frac{6}{16}$	$\frac{7}{20}$	$19\frac{3}{4}$	$\frac{5}{16}$	$\frac{6}{20}$	$16\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$	11	$\frac{4}{16}$	$\frac{5}{20}$
92	23	$\frac{7}{16}$	$\frac{8}{20}$	$22\frac{1}{2}$	$\frac{6}{16}$	$\frac{7}{20}$	$20\frac{3}{4}$	$\frac{6}{16}$	$\frac{7}{20}$	$17\frac{1}{4}$	$\frac{5}{16}$	$\frac{6}{20}$	$11\frac{1}{2}$	$\frac{4}{16}$	$\frac{5}{20}$
96	24	$\frac{7}{16}$	$\frac{8}{20}$	$23\frac{3}{8}$	$\frac{6}{16}$	$\frac{7}{20}$	$21\frac{5}{8}$	$\frac{6}{16}$	$\frac{7}{20}$	18	$\frac{5}{16}$	$\frac{6}{20}$	12	$\frac{4}{16}$	$\frac{5}{20}$



# TABLE 10.

and FULL-RIGGED STEAM VESSELS.

## TOPMASTS.

Length.	Heel.			Lower Part of Head.			Head.		
	Diameter.	Thickness.		Diameter.	Thickness.		Diameter.	Thickness.	
		Iron.	Steel.		Iron.	Steel.		Iron.	Steel.
Feet.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
32	12	$\frac{4}{16}$	$\frac{5}{20}$	$10\frac{1}{2}$	$\frac{4}{16}$	$\frac{5}{20}$	9	$\frac{3}{16}$	$\frac{3}{16}$
34	$12\frac{1}{2}$	$\frac{4}{16}$	$\frac{5}{20}$	11	$\frac{4}{16}$	$\frac{5}{20}$	$9\frac{1}{2}$	$\frac{3}{16}$	$\frac{3}{16}$
36	13	$\frac{4}{16}$	$\frac{5}{20}$	$11\frac{1}{2}$	$\frac{4}{16}$	$\frac{5}{20}$	10	$\frac{3}{16}$	$\frac{3}{16}$
38	14	$\frac{4}{16}$	$\frac{5}{20}$	$12\frac{1}{2}$	$\frac{4}{16}$	$\frac{5}{20}$	$10\frac{1}{2}$	$\frac{3}{16}$	$\frac{3}{16}$
40	$14\frac{1}{2}$	$\frac{4}{16}$	$\frac{5}{20}$	13	$\frac{4}{16}$	$\frac{5}{20}$	11	$\frac{3}{16}$	$\frac{3}{16}$
42	15	$\frac{5}{16}$	$\frac{6}{20}$	$13\frac{1}{2}$	$\frac{4}{16}$	$\frac{5}{20}$	$11\frac{1}{2}$	$\frac{4}{16}$	$\frac{5}{20}$
44	16	$\frac{5}{16}$	$\frac{6}{20}$	14	$\frac{4}{16}$	$\frac{5}{20}$	12	$\frac{4}{16}$	$\frac{5}{20}$
46	$16\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$	$14\frac{1}{2}$	$\frac{4}{16}$	$\frac{5}{20}$	$12\frac{1}{2}$	$\frac{4}{16}$	$\frac{5}{20}$
48	17	$\frac{6}{16}$	$\frac{7}{20}$	15	$\frac{5}{16}$	$\frac{6}{20}$	13	$\frac{5}{16}$	$\frac{6}{20}$
50	18	$\frac{6}{16}$	$\frac{7}{20}$	16	$\frac{5}{16}$	$\frac{6}{20}$	$13\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$
52	$18\frac{1}{2}$	$\frac{6}{16}$	$\frac{7}{20}$	$16\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$	14	$\frac{5}{16}$	$\frac{6}{20}$
54	19	$\frac{6}{16}$	$\frac{7}{20}$	17	$\frac{5}{16}$	$\frac{6}{20}$	$14\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$
56	20	$\frac{6}{16}$	$\frac{7}{20}$	18	$\frac{5}{16}$	$\frac{6}{20}$	15	$\frac{5}{16}$	$\frac{6}{20}$
58	$20\frac{1}{2}$	$\frac{6}{16}$	$\frac{7}{20}$	$18\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$	$15\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$
60	21	$\frac{6}{16}$	$\frac{7}{20}$	19	$\frac{5}{16}$	$\frac{6}{20}$	16	$\frac{5}{16}$	$\frac{6}{20}$
62	22	$\frac{6}{16}$	$\frac{7}{20}$	20	$\frac{5}{16}$	$\frac{6}{20}$	$16\frac{1}{2}$	$\frac{5}{16}$	$\frac{6}{20}$
64	23	$\frac{6}{16}$	$\frac{7}{20}$	21	$\frac{5}{16}$	$\frac{6}{20}$	17	$\frac{5}{16}$	$\frac{6}{20}$

TOPMASTS.—The plating should be of the thickness given in the Table. The seams of topmasts may be single riveted; the butts should be treble riveted, and their straps  $\frac{1}{16}$  of an inch thicker in iron topmasts, and  $\frac{1}{20}$  thicker in steel than the plates they connect. There should be doubling plates in the way of the lower mast cap. Topmasts should be efficiently strengthened in the way of the fid holes, and in the way of sheave holes where such are cut, by the doubling plates, iron hoops, or by other approved methods.

Topmast 38 feet in length and under 46 feet, to have two stiffening angles  $3'' \times 2\frac{1}{2}'' \times \frac{6}{16}''$  fitted as nearly as practicable at the fore and after parts of the mast.

Where the length is 46 feet and under 66 feet, the angles to be  $3\frac{1}{2}'' \times 3\frac{1}{2}'' \times \frac{6}{16}''$ .

The diameter of the topmasts at the lower cap, sheave hole, and topmast cap, to be in no case less than that of the yards at these places.

LOWER YARDS.—The plating should be of the thickness given in the Table. The seams of yards may be single riveted; their butts should be treble riveted, and connected by being overlapped, or by efficient butt straps. The plates should be doubled at the centre, and the doubling plates should extend beyond the truss hoops.

Where iron or steel masts and yards are to be constructed otherwise than in accordance with the Tables, plans and particulars of the same must be submitted for the approval of the Committee.

Where Steamers are intended to be fitted with topmasts for auxiliary purposes, they might be one-eighth less in diameter than prescribed by Table.









Table of Sizes and Tests for the STEEL WIRE STANDIN

REGISTER TONNAGE UNDER DECK.	Tons. 3000 AND UNDER 3500	Tons. 2300 AND UNDER 3000	Tons. 2300 AND UNDER 2600	Tons. 2000 AND UNDER 2300	Tons. 1800 AND UNDER 2000	Tons. 1600 AND UNDER 1800	Tons. 1400 AND UNDER 1600
PLATING NUMBER.	32000 AND UNDER 36000	29000 AND UNDER 32000	26600 AND UNDER 29000	24200 AND UNDER 26600	22500 AND UNDER 24200	20700 AND UNDER 22500	18800 AND UNDER 20700
	No. Size. inches.	No. Size. inches.	No. Size. inches.	No. Size. inches.	No. Size. inches.	No. Size. inches.	No. Size. inches.
FORE & MAIN Shrouds ...	6 5 $\frac{1}{2}$ and 2 cap	6 5 $\frac{1}{4}$ and 2 cap	6 5 and cap	6 4 $\frac{7}{8}$ and cap	6 4 $\frac{3}{4}$ and cap	6 4 $\frac{1}{2}$ and cap	6 4 and cap
„ „ Chain plates ...	2 $\frac{3}{4}$	2 $\frac{5}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{8}$	2 $\frac{1}{4}$	2 $\frac{1}{8}$	2
„ „ Dead-eyes ...	—	—	—	—	12 × 7	11 $\frac{1}{2}$ × 6 $\frac{1}{2}$	11 ×
„ „ Lanyards (hemp)	—	—	—	—	6	5 $\frac{3}{4}$	5
„ „ {Rigging Screws Diameter at bottom of thread}	2 $\frac{1}{4}$	2 $\frac{1}{8}$	2	1 $\frac{7}{8}$	1 $\frac{7}{8}$	1 $\frac{3}{4}$	1
„ „ {Rigging Screws Diameter of Pins}	2	1 $\frac{7}{8}$	1 $\frac{3}{4}$	1 $\frac{5}{8}$	1 $\frac{5}{8}$	1 $\frac{1}{2}$	1
„ „ Topmst. bckstys.	3 5 $\frac{1}{2}$	3 5 $\frac{1}{4}$	3 5	3 4 $\frac{7}{8}$	3 4 $\frac{3}{4}$	3 4 $\frac{1}{2}$	3 4
„ „ Top-gllt. bckstys.	2 4 $\frac{1}{4}$	2 4 $\frac{1}{8}$	2 3 $\frac{7}{8}$	2 3 $\frac{3}{4}$	2 3 $\frac{1}{2}$	2 3 $\frac{1}{4}$	2 3
„ „ Lower stays ...	2 5 $\frac{1}{2}$	2 5 $\frac{1}{4}$	2 5	2 4 $\frac{7}{8}$	2 4 $\frac{3}{4}$	2 4 $\frac{1}{2}$	2 4
„ „ Top-mast stays...	2 5 $\frac{1}{2}$	2 5 $\frac{1}{4}$	2 5	2 4 $\frac{7}{8}$	2 4 $\frac{3}{4}$	2 4 $\frac{1}{2}$	2 4
„ „ Top-gallant stays	4 $\frac{1}{4}$	4 $\frac{1}{8}$	3 $\frac{7}{8}$	3 $\frac{3}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{4}$	3
MIZEN Shrouds ...	5 4 $\frac{1}{2}$ and cap	5 4 $\frac{3}{8}$ and cap	5 4 $\frac{1}{4}$ and cap	5 4 $\frac{1}{8}$ and cap	5 4 and cap	5 3 $\frac{3}{4}$ and cap	5 3 and cap
„ Topmast backstays ...	3 4 $\frac{1}{2}$	3 4 $\frac{3}{8}$	3 4 $\frac{1}{4}$	3 4 $\frac{1}{8}$	3 4	3 3 $\frac{3}{4}$	3 3
„ Top-gallant backstays ...	2 3 $\frac{1}{4}$	2 3 $\frac{1}{8}$	2 3	2 2 $\frac{7}{8}$	2 2 $\frac{3}{4}$	2 2 $\frac{1}{2}$	2 2
„ Lower stays ...	2 4 $\frac{1}{2}$	2 4 $\frac{3}{8}$	2 4 $\frac{1}{4}$	2 4 $\frac{1}{8}$	2 4	2 3 $\frac{3}{4}$	2 3
„ Topmast stays ...	2 4 $\frac{1}{2}$	2 4 $\frac{3}{8}$	2 4 $\frac{1}{4}$	2 4 $\frac{1}{8}$	2 4	2 3 $\frac{3}{4}$	2 3
„ Top-gallant stays	3 $\frac{1}{4}$	3 $\frac{1}{8}$	3	2 $\frac{7}{8}$	2 $\frac{3}{4}$	2 $\frac{1}{2}$	2
BOBSTAY Bar ...	4 $\frac{1}{8}$	4 $\frac{1}{8}$	4	3 $\frac{7}{8}$	3 $\frac{3}{4}$	3 $\frac{5}{8}$	3
„ Pin ...	3 $\frac{1}{8}$	3 $\frac{1}{8}$	3	2 $\frac{7}{8}$	2 $\frac{3}{4}$	2 $\frac{5}{8}$	2
„ Chain ...	2 $\frac{1}{16}$	2 $\frac{1}{16}$	2	1 $\frac{5}{16}$	1 $\frac{4}{16}$	1 $\frac{3}{16}$	1
BOWSPRIT Shrouds (Chain) ...	2 1 $\frac{1}{8}$	2 1 $\frac{1}{8}$	2 1 $\frac{1}{16}$	2 1 $\frac{1}{16}$	2 1	2 1	2

1.—The above requirements are intended to apply to vessels in which the dimensions of the masts and yards are such as would not be deemed unusual for vessels of the respective tonnages; where these dimensions are extreme, in other exceptional cases where deviations from the above sizes are required, rigging plans showing the sizes and arrangements of the several parts should be submitted for the approval of the Committee.

2.—Where four masts are adopted instead of three, the tonnage of the vessel may be reduced one-fifth, and where five masts are adopted, one fourth, in obtaining the sizes of Rigging, &c., from the above table.

3.—Where pole masts are adopted in vessels requiring one cap shroud only, an additional cap shroud is to be fitted, when the number of lower shrouds may be correspondingly reduced.

4.—Where double top-gallant yards are to be adopted, a topmast cap backstay should be fitted in addition.



Tons. 1200 AND UNDER 1400		Tons. 1000 AND UNDER 1200		Tons. 800 AND UNDER 1000		Tons. 700 AND UNDER 800		Tons. 600 AND UNDER 700		Tons. 500 AND UNDER 600		Tons. 400 AND UNDER 500		Tons. 300 AND UNDER 400	
16800 AND UNDER 18800		14800 AND UNDER 16800		12700 AND UNDER 14800		11600 AND UNDER 12700		10300 AND UNDER 11600		9000 AND UNDER 10300		7700 AND UNDER 9000		6100 AND UNDER 7700	
No.	Size. inches.	No.	Size. inches.	No.	Size. inches.	No.	Size. inches.	No.	Size. inches.	No.	Size. inches.	No.	Size. inches.	No.	Size. inches.
6	4 $\frac{1}{8}$	6	4	5	3 $\frac{3}{4}$	5	3 $\frac{1}{2}$	5	3 $\frac{1}{4}$	5	3	4	2 $\frac{3}{4}$	4	2 $\frac{1}{2}$
and cap	1 $\frac{7}{8}$	and cap	1 $\frac{7}{8}$	and cap	1 $\frac{3}{4}$	and cap	1 $\frac{3}{4}$	and cap	1 $\frac{5}{8}$		1 $\frac{3}{8}$		1 $\frac{1}{4}$		1 $\frac{1}{4}$
10 $\frac{1}{2}$ × 6		10 × 6		9 $\frac{1}{2}$ × 5 $\frac{1}{2}$		9 × 5 $\frac{1}{2}$		8 $\frac{1}{2}$ × 5		8 × 5		7 $\frac{1}{2}$ × 4 $\frac{1}{2}$		7 × 4 $\frac{1}{2}$	
	5 $\frac{1}{4}$		5		4 $\frac{3}{4}$		4 $\frac{1}{2}$		4 $\frac{1}{4}$		4		3 $\frac{3}{4}$		3 $\frac{1}{2}$
	1 $\frac{5}{8}$		1 $\frac{5}{8}$		1 $\frac{1}{2}$		1 $\frac{1}{2}$		1 $\frac{3}{8}$		1 $\frac{1}{4}$		1 $\frac{1}{8}$		1 $\frac{1}{8}$
	1 $\frac{3}{8}$		1 $\frac{3}{8}$		1 $\frac{3}{8}$		1 $\frac{3}{8}$		1 $\frac{1}{4}$		1 $\frac{1}{8}$		1		1
3	4 $\frac{1}{8}$	3	4	2	3 $\frac{3}{4}$	2	3 $\frac{1}{2}$	2	3 $\frac{1}{4}$	2	3	2	2 $\frac{3}{4}$	2	2 $\frac{1}{2}$
2	2 $\frac{3}{4}$	2	2 $\frac{5}{8}$	2	2 $\frac{1}{2}$		2 $\frac{3}{8}$		2 $\frac{1}{4}$		2 $\frac{1}{8}$		2		1 $\frac{3}{4}$
2	4 $\frac{1}{8}$	2	4	2	3 $\frac{3}{4}$	2	3 $\frac{1}{2}$	2	3 $\frac{1}{4}$	2	3	2	2 $\frac{3}{4}$	2	2 $\frac{1}{2}$
2	4 $\frac{1}{8}$	2	4	2	3 $\frac{3}{4}$	2	3 $\frac{1}{2}$		3 $\frac{1}{4}$		3		2 $\frac{3}{4}$		2 $\frac{1}{2}$
	2 $\frac{3}{4}$		2 $\frac{5}{8}$		2 $\frac{1}{2}$		2 $\frac{3}{8}$		2 $\frac{1}{4}$		2 $\frac{1}{8}$		2		1 $\frac{3}{4}$
5	3 $\frac{1}{4}$	5	3	5	2 $\frac{7}{8}$	5	2 $\frac{3}{4}$	4	2 $\frac{5}{8}$	4	2 $\frac{1}{2}$	3	2 $\frac{3}{8}$	3	2 $\frac{1}{4}$
and cap	3 $\frac{1}{4}$														
3	3 $\frac{1}{4}$	3	3	2	2 $\frac{7}{8}$	2	2 $\frac{3}{4}$	2	2 $\frac{5}{8}$		2 $\frac{1}{2}$		2 $\frac{3}{8}$		2 $\frac{1}{4}$
2	2 $\frac{1}{8}$	2	2		1 $\frac{7}{8}$		1 $\frac{3}{4}$		1 $\frac{5}{8}$		1 $\frac{1}{2}$		1 $\frac{3}{8}$		1 $\frac{1}{4}$
2	3 $\frac{1}{4}$	2	3		2 $\frac{7}{8}$		2 $\frac{3}{4}$		2 $\frac{5}{8}$		2 $\frac{1}{2}$		2 $\frac{3}{8}$		2 $\frac{1}{4}$
2	3 $\frac{1}{4}$		3		2 $\frac{7}{8}$		2 $\frac{3}{4}$		2 $\frac{5}{8}$		2 $\frac{1}{2}$		2 $\frac{3}{8}$		2 $\frac{1}{4}$
	2 $\frac{1}{8}$		2		1 $\frac{7}{8}$		1 $\frac{3}{4}$		1 $\frac{5}{8}$		1 $\frac{1}{2}$		1 $\frac{3}{8}$		1 $\frac{1}{4}$
	3 $\frac{1}{4}$		3		2 $\frac{1}{2}$		2 $\frac{1}{4}$		2		2		2		2
	2 $\frac{1}{4}$		2 $\frac{1}{8}$		1 $\frac{7}{8}$		1 $\frac{5}{8}$		1 $\frac{1}{2}$		1 $\frac{1}{2}$		1 $\frac{1}{2}$		1 $\frac{1}{2}$
	1 $\frac{10}{16}$		1 $\frac{8}{16}$		1 $\frac{6}{16}$		1 $\frac{5}{16}$		1 $\frac{4}{16}$		1 $\frac{4}{16}$		1 $\frac{4}{16}$		1 $\frac{3}{16}$
2	$\frac{7}{8}$	2	$\frac{1}{16}$	2	$\frac{1}{16}$		$\frac{1}{16}$		$\frac{1}{16}$		$\frac{1}{16}$		$\frac{9}{16}$		$\frac{9}{16}$

STEEL WIRE  
STANDING RIGGING.

SIZE.	BREAK- ING TEST.	SIZE.	BREAK- ING TEST.
Inches.	Tons.	Inches.	Tons.
5 $\frac{1}{2}$	58	3 $\frac{1}{8}$	17 $\frac{1}{2}$
5 $\frac{1}{4}$	53	3	16
5	48	2 $\frac{7}{8}$	14 $\frac{1}{2}$
4 $\frac{7}{8}$	44	2 $\frac{3}{4}$	13
4 $\frac{3}{4}$	42	2 $\frac{5}{8}$	12
4 $\frac{5}{8}$	40	2 $\frac{1}{2}$	11
4 $\frac{1}{2}$	38	2 $\frac{3}{8}$	10
4 $\frac{3}{8}$	36	2 $\frac{1}{4}$	9
4 $\frac{1}{4}$	34	2 $\frac{1}{8}$	8
4 $\frac{1}{8}$	32	2	7
4	30	1 $\frac{7}{8}$	6
3 $\frac{7}{8}$	28	1 $\frac{3}{4}$	5 $\frac{1}{2}$
3 $\frac{3}{4}$	26	1 $\frac{5}{8}$	5
3 $\frac{5}{8}$	24	1 $\frac{1}{2}$	4
3 $\frac{1}{2}$	22	1 $\frac{3}{8}$	3 $\frac{1}{4}$
3 $\frac{3}{8}$	20 $\frac{1}{2}$	1 $\frac{1}{4}$	3
3 $\frac{1}{4}$	19		

5.—The steel wire ropes to be guaranteed to withstand the breaking stress given in the table, and no hemp is to be used in the strands, a hemp core only to be fitted.

6.—A short length of each of the wires composing the rigging will be required, after being galvanized, to withstand a tensile stress equivalent to that set forth in the Table, and the aggregate strength of the wires must not be less than 10 per cent. excess of that stress.

7.—Each wire will be required to be capable of being twisted around itself not less than eight times, and of being untwisted and straightened without breaking.

8.—Where it is proposed to adopt iron wire rigging the sizes proposed and the guaranteed tests should be submitted for the consideration of the Committee.

LLOYD'S REGISTER OF BRITISH  
AND FOREIGN SHIPPING,

2, White Lion Court, Cornhill, E.C.

13th April, 1893.



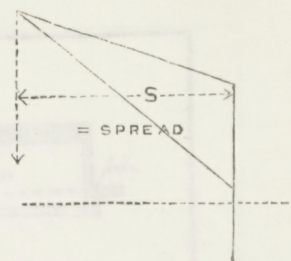


*New Table*

TABLE 12.

## ANCHOR CRANES.

The dimensions of the principal parts of ANCHOR CRANES to be in accordance with the following Table :—



WEIGHT OF ANCHOR INCLUDING STOCK.	SPREAD OF CRANE IN FEET.						
	9	10	11	12	13	14	15
Cwts.	DIAMETER OF MAIN POST AT DECK IN INCHES.						
20	6	6 $\frac{1}{4}$	6 $\frac{1}{2}$	6 $\frac{3}{4}$	6 $\frac{3}{4}$	7	7 $\frac{1}{4}$
25	6 $\frac{1}{2}$	6 $\frac{3}{4}$	7	7 $\frac{1}{4}$	7 $\frac{1}{4}$	7 $\frac{1}{2}$	7 $\frac{3}{4}$
30	7	7 $\frac{1}{4}$	7 $\frac{1}{2}$	7 $\frac{3}{4}$	7 $\frac{3}{4}$	8	8 $\frac{1}{4}$
35	7 $\frac{1}{4}$	7 $\frac{1}{2}$	7 $\frac{3}{4}$	8	8	8 $\frac{1}{4}$	8 $\frac{1}{2}$
40	7 $\frac{1}{2}$	7 $\frac{3}{4}$	8	8 $\frac{1}{4}$	8 $\frac{1}{2}$	8 $\frac{3}{4}$	9
45	8	8 $\frac{1}{4}$	8 $\frac{1}{2}$	8 $\frac{3}{4}$	9	9 $\frac{1}{4}$	9 $\frac{1}{2}$
50	8 $\frac{1}{4}$	8 $\frac{1}{2}$	8 $\frac{3}{4}$	9	9 $\frac{1}{4}$	9 $\frac{1}{2}$	9 $\frac{3}{4}$
55	8 $\frac{1}{2}$	8 $\frac{3}{4}$	9	9 $\frac{1}{4}$	9 $\frac{1}{2}$	9 $\frac{3}{4}$	10
60	8 $\frac{3}{4}$	9	9 $\frac{1}{4}$	9 $\frac{1}{2}$	9 $\frac{3}{4}$	10	10 $\frac{1}{4}$

CORRESPONDING DIMENSIONS OF MAIN POST, TIE RODS AND JIBS.													
				ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	
Diameter of Main Post at deck				6	6 $\frac{1}{2}$	7	7 $\frac{1}{2}$	8	8 $\frac{1}{2}$	9	9 $\frac{1}{2}$	10	10 $\frac{1}{2}$
Tie Rod        ...        ...        ...				1 $\frac{3}{4}$	1 $\frac{7}{8}$	2	2 $\frac{1}{8}$	2 $\frac{1}{4}$	2 $\frac{3}{8}$	2 $\frac{1}{2}$	2 $\frac{5}{8}$	2 $\frac{3}{4}$	2 $\frac{7}{8}$
Jib (Diameter at middle)        ...				3	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	4	4 $\frac{1}{4}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	5	5 $\frac{1}{4}$

If two Tie rods are fitted, the diameter of each to be  $\frac{2}{3}$ th that of the single rod required.

## BOATS' DAVITS.

In the cases of Boats and Davits of ordinary proportions the diameter of the davits in inches should be one-fifth of the length of the boats in feet, but in cases where the height and spread of the davits or the dimensions of the boats are not of ordinary proportions, the diameter of the davits in inches should be found from the formula :—

$$\sqrt[3]{\frac{L \times B \times D}{40} \left( \frac{H}{3} + S \right)}$$

where L, B and D are the dimensions of the boat, H the height of the davit above its uppermost point of support, and S the spread of the davit, each of these dimensions being in feet.

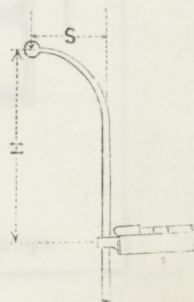
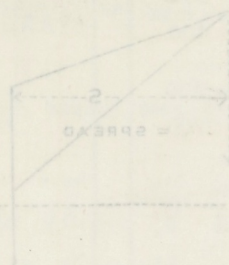




TABLE 12.



## ANCHOR CRANES.

The dimensions of the principal parts of ANCHOR CRANES to be in accordance with the following

Table:—

WRIGHT OF ANCHOR STOCK	SPREAD OF CRANE IN FEET						DIAMETER OF MAIN POST AT DECK IN INCHES	CORRESPONDING DIMENSIONS OF MAIN POST, THE RODS AND TIPS
	9	10	11	12	13	14	15	
20	6	6 1/2	7	7 1/2	8	8 1/2	9	Diameter of Main Post at deck
25	6 1/2	7	7 1/2	8	8 1/2	9	9 1/2	
30	7	7 1/2	8	8 1/2	9	9 1/2	10	The Rod
35	7 1/2	8	8 1/2	9	9 1/2	10	10 1/2	Tip (Diameter at middle)
40	8	8 1/2	9	9 1/2	10	10 1/2	11	
45	8 1/2	9	9 1/2	10	10 1/2	11	11 1/2	
50	9	9 1/2	10	10 1/2	11	11 1/2	12	
55	9 1/2	10	10 1/2	11	11 1/2	12	12 1/2	
60	10	10 1/2	11	11 1/2	12	12 1/2	13	

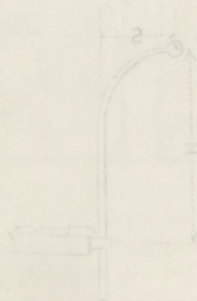
If two rods are fitted, the diameter of each to be 1/2 that of the single rod required.

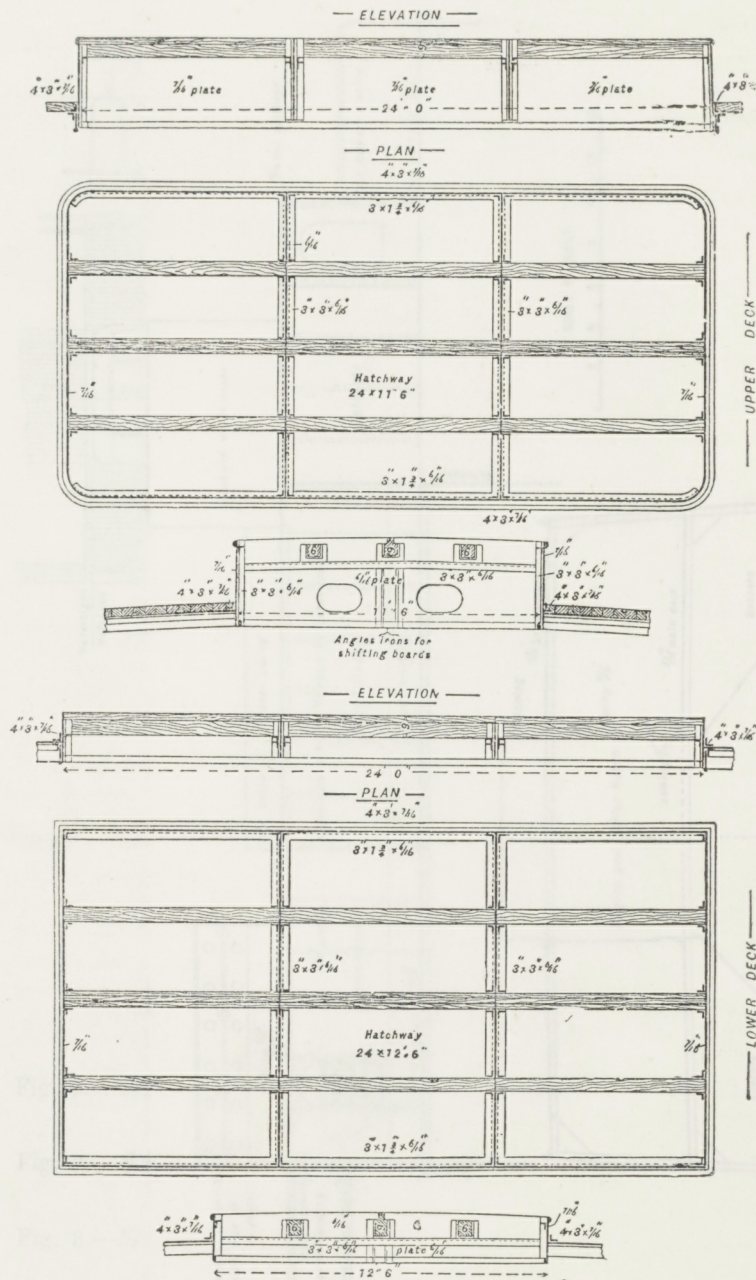
## BOATS' DAVITS.

In the case of Boats and Davits of ordinary proportions the diameter of the davits in inches should be one-fifth of the length of the boats in feet, but in cases where the height and spread of the davits or the dimensions of the boats are not of ordinary proportions, the diameter of the davits in inches should be found from the formula:—

$$\sqrt{\frac{L \times B \times D}{40} \left( \frac{H}{3} + 8 \right)}$$

where L, B and D are the dimensions of the boat, H the height of the davit above its uppermost point of support, and S the spread of the davit, each of these dimensions being in feet.

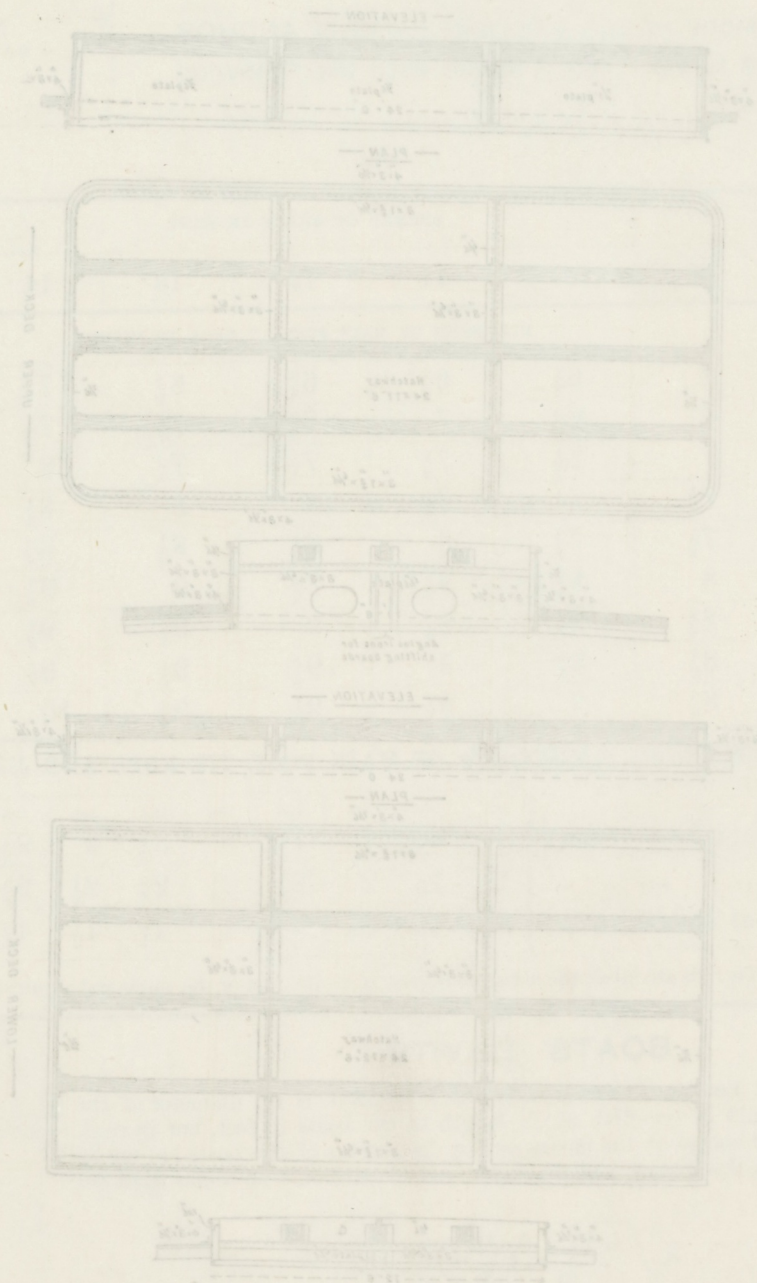




*Sketch showing arrangement of Shifting Beams in Cargo Hatchways.*



Sketch showing arrangement of Raising Beams in Cargo Hatchways.





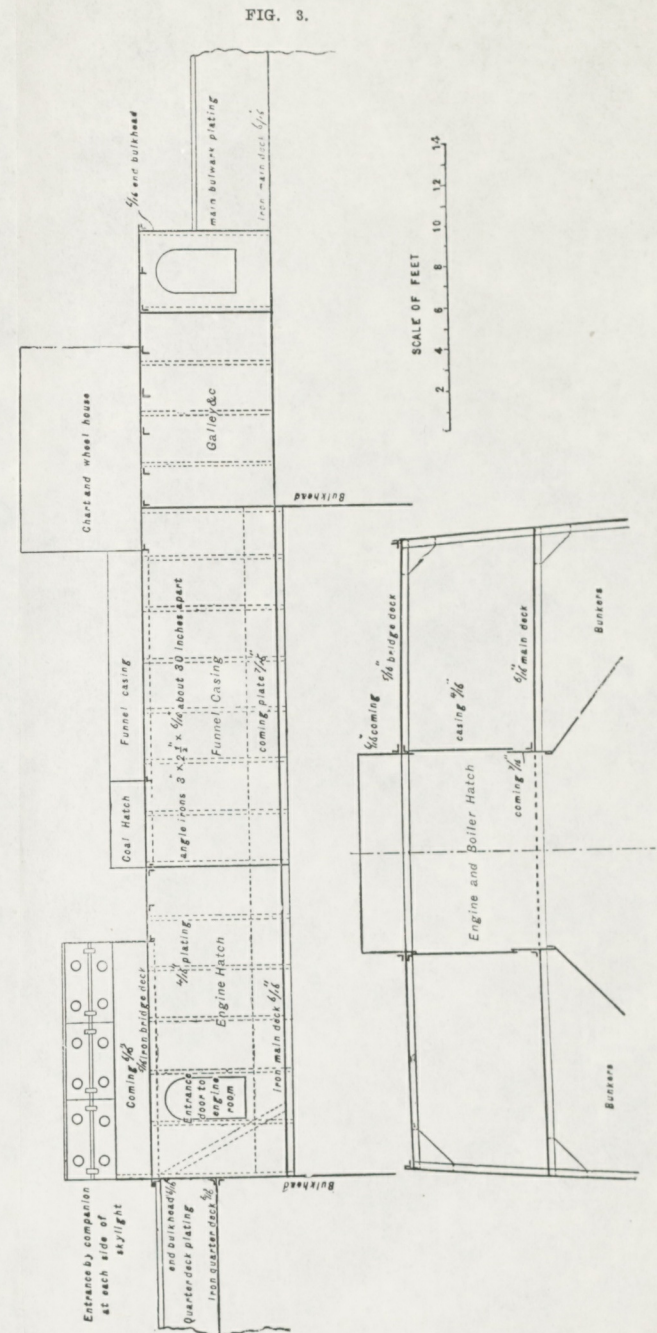
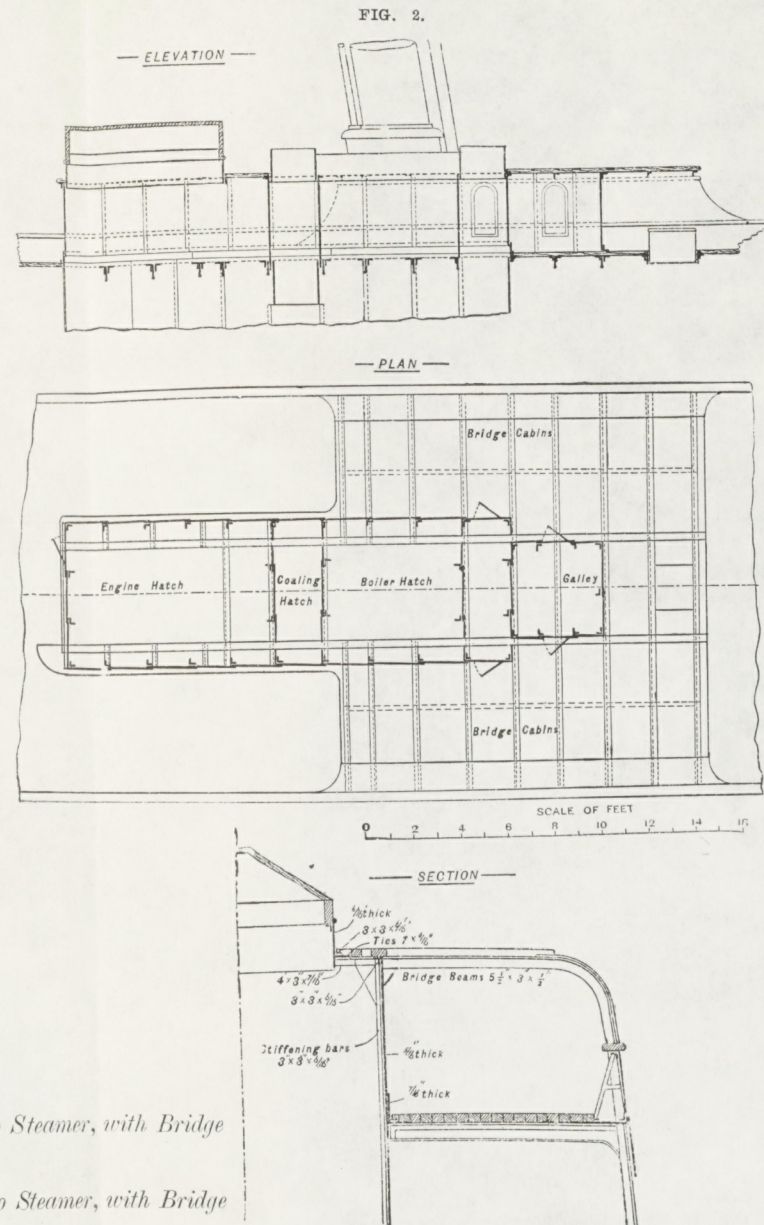
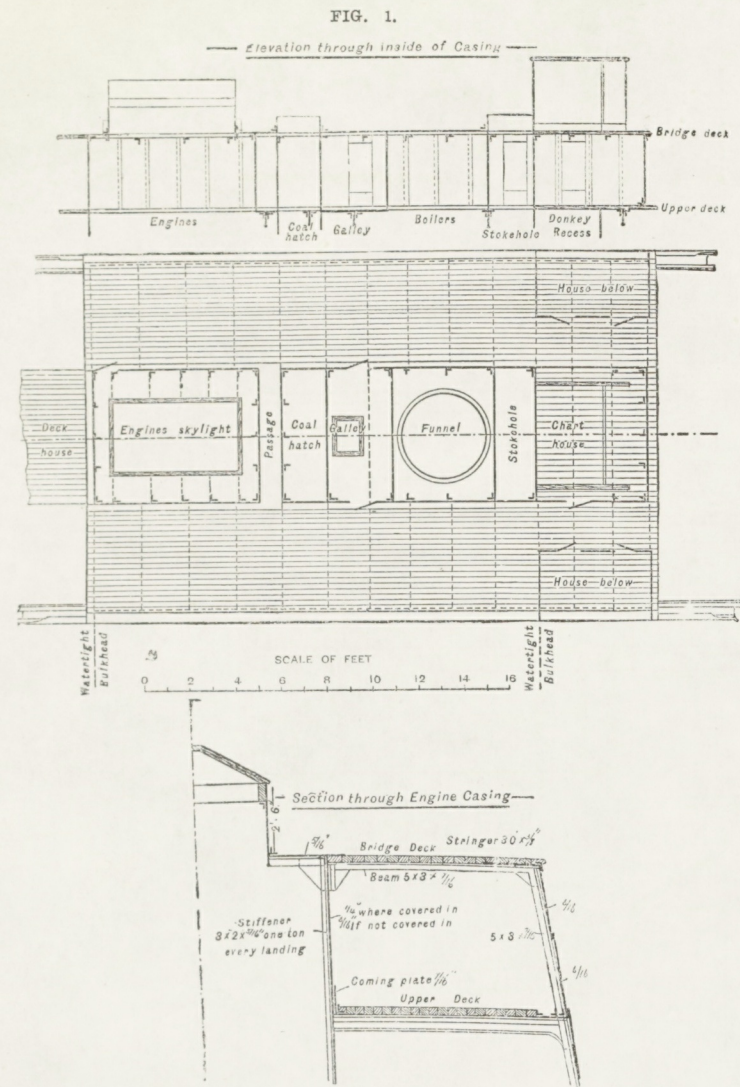


Fig. 1.—Sketch of Engine and Boiler Casing of a Three-decked Cargo Steamer, with Bridge Deck extending the whole length of the Openings.

Fig. 2.—Sketch of Engine and Boiler Casing of a Three-decked Cargo Steamer, with Bridge Deck covering the Boiler Hatchway.

Fig. 3.—Sketch of Engine and Boiler Casings in a Vessel with a Long Raised Quarter Deck and Enclosed Bridge House.







(For Steam Vessels, see other side).

*Extract from the Rules, Section 32.*

† In vessels having a *raised quarter deck*, or a poop, or top-gallant forecastle, or deck houses, or awning-deck, or spar deck, the total tonnage below the tonnage deck is to regulate the scantlings of the hull, but the register tonnage, as cut on the main beam of sailing vessels and of steam vessels, *with the addition of the tonnage of the space required for propelling power*, is to regulate the equipment.

But in vessels where the tonnage of the erections above the tonnage deck is less than that allowed for crew space, then the difference between the tonnage of these erections and the tonnage of the space allowed for crew is to be added to the register tonnage, cut on the main beam, for the tonnage that is to regulate the equipment.

No. 304.

## LLOYD'S REGISTER OF BRITISH AND FOREIGN SHIPPING.

## CHAIN CABLES.

### Testing to Breaking Strain.

"Chains tested under the Chain Cable and Anchor Act of 1864, at a Machine recognised by the Committee, will be accepted for any Vessel built, commenced, or contracted for *prior* to the 1st July, 1872; and all Vessels built, commenced, or contracted for *after* the 30th June, 1872, will be required to be supplied with Chains tested in conformity with the requirements of the New Act."

By order of the Committee,

BERNARD WAYMOUTH.

*Secretary.*

2, White Lion Court, Cornhill, London, E.C.

1st January, 1873.

(1) STEEL WIRE TOWLINES, HAWSERS AND WARPS.

(1) When steel wire towlines, hawsers, or warps are adopted, a short length of each of the wires composing the towline, &c., will be required, after being galvanised, to withstand a tensile stress equivalent to that set forth in Table 22, and the aggregate strength of the wires must not be less than ten per cent. in excess of that stress.

Each wire will be required to be capable of being twisted around itself not less than eight times, and of being untwisted and straightened without breaking.

Each manufacturer to be required to provide on his premises machines suitable for satisfactorily making the foregoing tests, and the works to be at all times open to the inspection of the Society's Surveyors, who are to be empowered to retest any hawser or towline for which a certificate has been issued by the manufacturer.

Printed Forms of Certificates, approved by the Committee, to be given by the Manufacturers of Steel Wire Hawsers, will be supplied to them upon application to the Secretary.

20th December, 1883.

(a) By Section 39 of the Rules for the Building and Classification of *Iron and Steel Vessels*, it is provided that "The equipment is to be regulated by the *Number* produced by the sum of the measurements of the half-moulded breadth of the vessel at the middle of the length, the depth from the upper part of keel to the top of the upper-deck beams, with the normal round-up, and the girth of the half-midship frame section of the vessel, measured from the centre line at top of keel to the upper deck stringer plate, multiplied by the length of the vessel, for a one, two, and three-decked vessel, and for a spar-decked vessel."

For a vessel with a poop, top-gallant forecastle, or a raised quarter-deck, the equipment number to be increased *one-fifteenth* beyond that which it would be if she were flush-decked.

*Lloyd's Register of Shipping, 2, White Lion Court, Cornhill.  
13th April, 1893.*

Minimum Weights of Anchors, ex. Stock; Sizes, Lengths and Weights of Chains, and the Proof Strain to which they are to be tested per Chain Cables of Towlines, Hawasers and Warps. The Anchors, and the links of the Chains to be of unexceptionable form and proportions.

Numbers for  
IRON AND STEEL  
Vessels.  
See Footnote (a).

GROSS  
TONNAGE  
LESS  
CREW  
SPACE.  
See Note †

ANCHORS.

NUMBER.

BOWER ANCHORS (b) (d).

STREAM AND KEDGE ANCHORS.

Ex. Stock.

Ex. Stock.

STUD-CHAIN CABLES (e) (f) (h).

CHAIN CABLES, HAWSERS, &c.

STREAM, CHAIN OR STEEL WIRE (g) (i)

TOWLINE: HEMP OR STEEL WIRE (j)

HAWSERS AND  
WARPS.  
20 fathoms or  
each.

GROSS  
TONNAGE  
LESS  
CREW  
SPACE.  
See Note †

Numbers for  
IRON AND STEEL  
Vessels.  
See Footnote (a).

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ANCHORS.

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CHAIN CABLES, HAWSERS, &c.

ANCHORS.

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(b) In order to meet the requirements of different trades, the weights of Anchors as given in the above Table may be modified as under :—  
Where two Bower Anchors only are required, one of them may be  $7\frac{1}{2}$  per cent. lighter than the weight set forth above, provided the collective weight of the two Anchors is equal to that given in the Table.

When three Bower Anchors are required, one of them may be 15 per cent., and another 71 per cent. lighter than the weight set forth above, provided the collective weight of the three Anchors is equal to that given in the Table, but in no case may the best Bower Anchor be lighter than prescribed in the Table, nor the third Bower be lighter than is allowed by this footnote.

(d) All Anchors, including Stream and Kedge Anchors, exceeding 168 lbs. in weight, ex. Stock, to be tested according to the requirements of the Act of Parliament, and the Certificates of Test produced.

\* The tests of Anchors in this Table are approximate tests; or as near the Statutory tests as can be expressed in tons and aliquot parts.

(e) The Chain Cables and Stream Chains to be tested in all cases according to the requirements of the Act of Parliament, and the Certificates of Test produced.

(F) There should be included in the above weights, 2 End Shackles to each Cable; that is 4 for each outfit which contains two Cables.

(g) There should be included in the above weights, 2 End Shackles to each Stream Chain.

(h) Unstudded close-link Chains will be admitted as Cables, if proved to *two-thirds* the Test required for Stud-link Chains, for the *tensile strain*, and 100 per cent. above the *tensile strain* for the *breaking strain*.

(i) When steel wire Towsines or Hawsers are adopted, see note i at side of Table.

Where a departure from the requirements of the Table for Hawsers and Warps is proposed, the same should be in all cases submitted in the first place for the approval of the Committee.



Minimum Weights of Anchors, ex. Stock and Stockless; Sizes, Lengths and Weights of Chains, and the Proof Strain to which they are to be tested per Chain Cables and Anchors Act. Also Sizes and Lengths of Towlines, Hawsers and Warps.

The Anchors, and the links of the Chains to be of unexceptionable form and proportions.

Numbers for IRON AND STEEL Vessels. See Footnote (a)	GROSS TONNAGE LESS CREW SPACE. See Note †	ANCHORS.														CHAIN CABLES, HAWSERS, &c.																				GROSS TONNAGE LESS CREW SPACE. See Note †	Numbers for IRON AND STEEL Vessels. See Footnote (a)	Equipment for SAILING AND STEAM TRAWLERS.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
		BOWER ANCHORS (b) (d)														STREAM AND KEDGE ANCHORS (e)				STUD-CHAIN CABLES (e) (f) (h)								STREAM, CHAIN or STEEL WIRE (e) (g)										TOWLINE: HEMP OR STEEL WIRE (i)				HAWSERS AND WARPS. 30 Fathoms of each.		REGISTERED U.D. TONNAGE.		ANCHORS.				CHAIN (e) (f) (h).				HAWSERS.		WARPS.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
		NUMBER.			Ex. Stock.			Stockless.			Ex. Stock.				Length.				Minimum Weight.				Length.				CHAIN.				STEEL WIRE (i)				Length.			HEMP.		STEEL WIRE.		WARPS.		Sailing Trawlers.		Steam Trawlers.		No.		1st.		2nd.		3rd.		Length.		Diameter.		Minimum Weight.				Length.		Size.		Length.		Size.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
		Bowers.	Stream.	Kedge.	Weight.	Test. †	Collective Weight.	Weight.	Test. †	Collective Weight.	Stream.	Test. †	Kedge.	Test. †	Fathoms.	Inches.	Tons.	Proved to Statutory Test.	Breaking Test.	Minimum Weight.	Fathoms.	Inches.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Inches.	Tons.	Fathoms.	Inches.	Inches.	Tons.	Inches.			Inches.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Fathms.	Inches.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Fathms.	In.	Fathms.	In.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
		See Note †	See Note †	See Note †	Cwts.	Tons.	Cwts.	Cwts.	Tons.	Cwts.	Cwts.	Tons.	Cwts.	Tons.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.			Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.	qrs.	lbs.	Cwts.



# STEEL VESSELS.

Table of Minimum Dimensions of FRAM


NUMBER OF FRAMES, REVERSED FRAMES, BOLTS, AND PLATES	SPACING OF FRAMES	FRAMES			of $\Gamma$ and Channels for FRAMES for three or four lengths and plates	Reversed Frames
		Dimensions of angles or plates between the frames and bolts	Dimensions of angles or plates between the frames and bolts	Dimensions of angles or plates between the frames and bolts		
31 and under	30	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{2}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{2}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{2}$	...	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{2}$
37 and under	31	$3 \times 2\frac{1}{2} \times \frac{1}{2}$	$3 \times 2\frac{1}{2} \times \frac{1}{2}$	$3 \times 2\frac{1}{2} \times \frac{1}{2}$	...	$3 \times 2\frac{1}{2} \times \frac{1}{2}$
43 and under	31	$3 \times 3 \times \frac{1}{2}$	$3 \times 3 \times \frac{1}{2}$	$3 \times 3 \times \frac{1}{2}$	...	$3 \times 3 \times \frac{1}{2}$
52 and under	32	$3\frac{1}{2} \times 3 \times \frac{1}{2}$	$3\frac{1}{2} \times 3 \times \frac{1}{2}$	$3\frac{1}{2} \times 3 \times \frac{1}{2}$	...	$3\frac{1}{2} \times 3 \times \frac{1}{2}$
57 and under	32	$3\frac{1}{2} \times 3 \times \frac{1}{2}$	$3\frac{1}{2} \times 3 \times \frac{1}{2}$	$3\frac{1}{2} \times 3 \times \frac{1}{2}$	...	$3\frac{1}{2} \times 3 \times \frac{1}{2}$
61 and under	33	$4 \times 3 \times \frac{1}{2}$	$4 \times 3 \times \frac{1}{2}$	$4 \times 3 \times \frac{1}{2}$	...	$4 \times 3 \times \frac{1}{2}$
65 and under	33	$4 \times 3 \times \frac{1}{2}$	$4 \times 3 \times \frac{1}{2}$	$4 \times 3 \times \frac{1}{2}$	...	$4 \times 3 \times \frac{1}{2}$
68 and under	33	$4\frac{1}{2} \times 3 \times \frac{1}{2}$	$4\frac{1}{2} \times 3 \times \frac{1}{2}$	$4\frac{1}{2} \times 3 \times \frac{1}{2}$	...	$4\frac{1}{2} \times 3 \times \frac{1}{2}$
71 and under	34	$4\frac{1}{2} \times 3 \times \frac{1}{2}$	$4\frac{1}{2} \times 3 \times \frac{1}{2}$	$4\frac{1}{2} \times 3 \times \frac{1}{2}$	...	$4\frac{1}{2} \times 3 \times \frac{1}{2}$
73 and under	34	$5 \times 3 \times \frac{1}{2}$	$5 \times 3 \times \frac{1}{2}$	$5 \times 3 \times \frac{1}{2}$	...	$5 \times 3 \times \frac{1}{2}$
76 and under	34	$5 \times 3 \times \frac{1}{2}$	$5 \times 3 \times \frac{1}{2}$	$5 \times 3 \times \frac{1}{2}$	...	$5 \times 3 \times \frac{1}{2}$
80 and under	34	$5 \times 3 \times \frac{1}{2}$	$5 \times 3 \times \frac{1}{2}$	$5 \times 3 \times \frac{1}{2}$	...	$5 \times 3 \times \frac{1}{2}$
82 and under	34	$5 \times 3\frac{1}{2} \times \frac{1}{2}$	$5 \times 3\frac{1}{2} \times \frac{1}{2}$	$5 \times 3\frac{1}{2} \times \frac{1}{2}$	...	$5 \times 3\frac{1}{2} \times \frac{1}{2}$
85 and under	34	$5\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{2}$	$5\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{2}$	$5\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{2}$	...	$5\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{2}$
91 and under	34	$5\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{2}$	$5\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{2}$	$5\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{2}$	...	$5\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{2}$
97 and under	35	$6 \times 3\frac{1}{2} \times \frac{1}{2}$	$6 \times 3\frac{1}{2} \times \frac{1}{2}$	$6 \times 3\frac{1}{2} \times \frac{1}{2}$	...	$6 \times 3\frac{1}{2} \times \frac{1}{2}$
103 and under	35	$6 \times 3\frac{1}{2} \times \frac{1}{2}$	$6 \times 3\frac{1}{2} \times \frac{1}{2}$	$6 \times 3\frac{1}{2} \times \frac{1}{2}$	...	$6 \times 3\frac{1}{2} \times \frac{1}{2}$
109 and under	36	$6\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{2}$	$6\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{2}$	$6\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{2}$	...	$6\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{2}$
115 and under	36	$7 \times 3\frac{1}{2} \times \frac{1}{2}$	$7 \times 3\frac{1}{2} \times \frac{1}{2}$	$7 \times 3\frac{1}{2} \times \frac{1}{2}$	...	$7 \times 3\frac{1}{2} \times \frac{1}{2}$

Notes:—When spacing than the above may be adopted provided the thickness given for Channel or  $\Gamma$  sections is maintained.  
 LONDON: WHITE LION COURT, CORNHILL, LONDON, E.C. 4.  
 1892.




# STEEL VESSELS.

Table of Minimum Dimensions of FRAMES

NUMBERS. For Frames, Reversed Frames, Bulkheads, and Pillars. (See Section 2.)	SPACING OF FRAMES.	FRAMES.		Reversed Frames.	Dimensions of  and Channel bar Frames for three-fifths length amidships.	Bulkheads.	
		Dimensions of angles for three- fifths the length of vessel amidships, and bulkheads.	Dimensions of angles before and abaft the three-fifths length.	Dimensions of Reversed angles all fore and aft.		Lower Half.	Upper Half.
31 and under 37	20	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{20}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{20}$	$2\frac{1}{4} \times 2\frac{1}{4} \times \frac{5}{20}$	...	$\frac{5}{20}$	$\frac{5}{20}$
37 and under 45	21	$3 \times 2\frac{1}{2} \times \frac{5}{20}$	$3 \times 2\frac{1}{2} \times \frac{5}{20}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{20}$	...	$\frac{5}{20}$	$\frac{5}{20}$
45 and under 52	21	$3 \times 3 \times \frac{6}{20}$	$3 \times 3 \times \frac{5}{20}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{20}$	...	$\frac{5}{20}$	$\frac{5}{20}$
52 and under 57	22	$3\frac{1}{2} \times 3 \times \frac{6}{20}$	$3\frac{1}{2} \times 3 \times \frac{5}{20}$	$3 \times 2\frac{1}{2} \times \frac{5}{20}$	$3\frac{1}{2} \times 3 \times 3 \times \frac{7}{20}$	$\frac{6}{20}$	$\frac{5}{20}$
57 and under 61	22	$3\frac{1}{2} \times 3 \times \frac{7}{20}$	$3\frac{1}{2} \times 3 \times \frac{6}{20}$	$3 \times 2\frac{1}{2} \times \frac{6}{20}$	$3\frac{1}{2} \times 3 \times 3 \times \frac{8}{20}$	$\frac{6}{20}$	$\frac{5}{20}$
61 and under 65	23	$4 \times 3 \times \frac{7}{20}$	$4 \times 3 \times \frac{6}{20}$	$3 \times 3 \times \frac{6}{20}$	$4 \times 3 \times 3 \times \frac{8}{20}$	$\frac{6}{20}$	$\frac{6}{20}$
65 and under 68	23	$4 \times 3 \times \frac{7}{20}$	$4 \times 3 \times \frac{6}{20}$	$3 \times 3 \times \frac{7}{20}$	$4 \times 3 \times 3 \times \frac{8}{20}$	$\frac{6}{20}$	$\frac{6}{20}$
68 and under 71	23	$4\frac{1}{2} \times 3 \times \frac{7}{20}$	$4\frac{1}{2} \times 3 \times \frac{6}{20}$	$3 \times 3 \times \frac{7}{20}$	$4\frac{1}{2} \times 3 \times 3 \times \frac{8}{20}$	$\frac{6}{20}$	$\frac{6}{20}$
71 and under 73	24	$4\frac{1}{2} \times 3 \times \frac{8}{20}$	$4\frac{1}{2} \times 3 \times \frac{7}{20}$	$3 \times 3 \times \frac{7}{20}$	$4\frac{1}{2} \times 3 \times 3 \times \frac{9}{20}$	$\frac{6}{20}$	$\frac{6}{20}$
73 and under 76	24	$5 \times 3 \times \frac{8}{20}$	$5 \times 3 \times \frac{7}{20}$	$3 \times 3 \times \frac{7}{20}$	$5 \times 3 \times 3 \times \frac{9}{20}$	$\frac{6}{20}$	$\frac{6}{20}$
76 and under 80	24	$5 \times 3 \times \frac{8}{20}$	$5 \times 3 \times \frac{7}{20}$	$3\frac{1}{2} \times 3 \times \frac{8}{20}$	$5 \times 3 \times 3 \times \frac{10}{20}$	$\frac{7}{20}$	$\frac{6}{20}$
80 and under 85	24	$5 \times 3\frac{1}{2} \times \frac{8}{20}$	$5 \times 3\frac{1}{2} \times \frac{7}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$	$5 \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{10}{20}$	$\frac{7}{20}$	$\frac{6}{20}$
85 and under 91	24	$5\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$	$5\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$	$4 \times 3\frac{1}{2} \times \frac{8}{20}$	$5\frac{1}{2} \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{10}{20}$	$\frac{7}{20}$	$\frac{6}{20}$
91 and under 97	24	$5\frac{1}{2} \times 3\frac{1}{2} \times \frac{9}{20}$	$5\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$	$4 \times 3\frac{1}{2} \times \frac{9}{20}$	$5\frac{1}{2} \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{11}{20}$	$\frac{7}{20}$	$\frac{6}{20}$
97 and under 103	25	$6 \times 3\frac{1}{2} \times \frac{10}{20}$	$6 \times 3\frac{1}{2} \times \frac{9}{20}$	$4\frac{1}{2} \times 3\frac{1}{2} \times \frac{9}{20}$	$6 \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{12}{20}$	$\frac{8}{20}$	$\frac{7}{20}$
103 and under 109	25	$6 \times 3\frac{1}{2} \times \frac{10}{20}$	$6 \times 3\frac{1}{2} \times \frac{9}{20}$	$4\frac{1}{2} \times 3\frac{1}{2} \times \frac{10}{20}$	$6\frac{1}{2} \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{12}{20}$	$\frac{8}{20}$	$\frac{7}{20}$
109 and under 115	26	$6\frac{1}{2} \times 3\frac{1}{2} \times \frac{10}{20}$	$6\frac{1}{2} \times 3\frac{1}{2} \times \frac{9}{20}$	$4\frac{1}{2} \times 4 \times \frac{10}{20}$	$7 \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{12}{20}$	$\frac{8}{20}$	$\frac{7}{20}$
115 and under 120	26	$7 \times 3\frac{1}{2} \times \frac{10}{20}$	$6\frac{1}{2} \times 3\frac{1}{2} \times \frac{9}{20}$	$4\frac{1}{2} \times 4 \times \frac{10}{20}$	$7 \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{13}{20}$	$\frac{8}{20}$	$\frac{7}{20}$

MEMO.:—Wider spacing than the above may be adopted provided the

The thickness given for Channel or  Sections is to

LLOYD'S REGISTER OF SHIPPING, 2, WHITE LION COURT, CORNHILL, LONDON, E.C.,

15th December, 1892.



Diameter of Solid pillars, and diameter and thickness of hollow malleable pillars to beams.			
Solid Pillars.		Hollow malleable Pillars.	
Eld.	'Tween dk. poop, bridge, and forecastle.	Hold.	'Tween dk. poop, bridge, and forecastle.
inches.	inches.	inches.	inches.
...	2 $\frac{1}{4}$	...	3 $\times$ $\frac{5}{16}$
...	2 $\frac{1}{2}$	...	3 $\frac{1}{4}$ $\times$ $\frac{5}{16}$
2 $\frac{1}{2}$	2 $\frac{3}{8}$	3 $\frac{1}{4}$ $\times$ $\frac{6}{16}$	3 $\frac{1}{4}$ $\times$ $\frac{5}{16}$
2 $\frac{5}{8}$	2 $\frac{3}{8}$	3 $\frac{1}{2}$ $\times$ $\frac{6}{16}$	3 $\frac{1}{4}$ $\times$ $\frac{5}{16}$
2 $\frac{3}{4}$	2 $\frac{1}{2}$	3 $\frac{3}{4}$ $\times$ $\frac{6}{16}$	3 $\frac{1}{4}$ $\times$ $\frac{6}{16}$
2 $\frac{7}{8}$	2 $\frac{1}{2}$	3 $\frac{7}{8}$ $\times$ $\frac{6}{16}$	3 $\frac{1}{4}$ $\times$ $\frac{6}{16}$
3	2 $\frac{1}{2}$	4 $\times$ $\frac{6}{16}$	3 $\frac{1}{4}$ $\times$ $\frac{6}{16}$
3 $\frac{1}{8}$	2 $\frac{5}{8}$	4 $\times$ $\frac{7}{16}$	3 $\frac{1}{2}$ $\times$ $\frac{6}{16}$
3 $\frac{1}{4}$	2 $\frac{5}{8}$	4 $\frac{1}{8}$ $\times$ $\frac{7}{16}$	3 $\frac{1}{2}$ $\times$ $\frac{6}{16}$
3 $\frac{3}{8}$	2 $\frac{5}{8}$	4 $\frac{1}{4}$ $\times$ $\frac{7}{16}$	3 $\frac{1}{2}$ $\times$ $\frac{6}{16}$
3 $\frac{1}{2}$	2 $\frac{3}{4}$	4 $\frac{1}{2}$ $\times$ $\frac{7}{16}$	3 $\frac{3}{4}$ $\times$ $\frac{6}{16}$
3 $\frac{5}{8}$	2 $\frac{3}{4}$	4 $\frac{3}{4}$ $\times$ $\frac{7}{16}$	3 $\frac{3}{4}$ $\times$ $\frac{6}{16}$
3 $\frac{5}{8}$	2 $\frac{3}{4}$	4 $\frac{3}{4}$ $\times$ $\frac{7}{16}$	3 $\frac{3}{4}$ $\times$ $\frac{6}{16}$
3 $\frac{3}{4}$	2 $\frac{7}{8}$	5 $\times$ $\frac{7}{16}$	3 $\frac{7}{8}$ $\times$ $\frac{6}{16}$
3 $\frac{3}{4}$	2 $\frac{7}{8}$	5 $\times$ $\frac{7}{16}$	3 $\frac{7}{8}$ $\times$ $\frac{6}{16}$
4	3	5 $\frac{1}{2}$ $\times$ $\frac{7}{16}$	4 $\times$ $\frac{6}{16}$
4 $\frac{1}{4}$	3	5 $\frac{3}{4}$ $\times$ $\frac{7}{16}$	4 $\times$ $\frac{6}{16}$
4 $\frac{1}{2}$	3 $\frac{1}{4}$	6 $\times$ $\frac{7}{16}$	4 $\frac{1}{8}$ $\times$ $\frac{7}{16}$

TABLE FOR SIZES OF FLOORS.									
Floor plates in engine space of steam vessels to be $\frac{1}{16}$ of an inch thicker, and in the boiler space $\frac{3}{16}$ of an inch thicker than in this Table.									
NUMBERS FOR FLOORS. (See Section 2.)		For three-fifths length amidships.	Thick-ness at Ends.	NUMBERS FOR FLOORS—continued. (See Section 2.)		For three-fifths length amidships.	Thick-ness at Ends.		
		inches.	inches.			inches.	inches.		
31 and under	32	$9 \times \frac{5}{20}$	$\frac{5}{20}$	66 and under	67	$20 \times \frac{8}{20}$	$\frac{7}{20}$		
32 and under	33	$9\frac{1}{2} \times \frac{5}{20}$	$\frac{5}{20}$	67 and under	68	$20\frac{1}{2} \times \frac{8}{20}$	$\frac{7}{20}$		
33 and under	34	$10 \times \frac{5}{20}$	$\frac{5}{20}$	68 and under	69	$21 \times \frac{8}{20}$	$\frac{7}{20}$		
34 and under	35	$10\frac{1}{2} \times \frac{5}{20}$	$\frac{5}{20}$	69 and under	70	$21 \times \frac{9}{20}$	$\frac{7}{20}$		
35 and under	37	$11 \times \frac{5}{20}$	$\frac{5}{20}$	70 and under	71	$21\frac{1}{2} \times \frac{9}{20}$	$\frac{7}{20}$		
37 and under	39	$11\frac{1}{2} \times \frac{5}{20}$	$\frac{5}{20}$	71 and under	72	$22 \times \frac{9}{20}$	$\frac{7}{20}$		
39 and under	41	$12 \times \frac{5}{20}$	$\frac{5}{20}$	72 and under	73	$22\frac{1}{2} \times \frac{9}{20}$	$\frac{7}{20}$		
41 and under	43	$12 \times \frac{6}{20}$	$\frac{5}{20}$	73 and under	74	$23 \times \frac{9}{20}$	$\frac{7}{20}$		
43 and under	45	$12\frac{1}{2} \times \frac{6}{20}$	$\frac{5}{20}$	74 and under	76	$23\frac{1}{2} \times \frac{9}{20}$	$\frac{7}{20}$		
45 and under	47	$13 \times \frac{6}{20}$	$\frac{5}{20}$	76 and under	78	$24 \times \frac{9}{20}$	$\frac{7}{20}$		
47 and under	49	$13\frac{1}{2} \times \frac{6}{20}$	$\frac{5}{20}$	78 and under	80	$24 \times \frac{10}{20}$	$\frac{8}{20}$		
49 and under	51	$14 \times \frac{6}{20}$	$\frac{5}{20}$	80 and under	84	$24\frac{1}{2} \times \frac{10}{20}$	$\frac{8}{20}$		
51 and under	52	$14\frac{1}{2} \times \frac{6}{20}$	$\frac{5}{20}$	84 and under	88	$25 \times \frac{10}{20}$	$\frac{8}{20}$		
52 and under	53	$15 \times \frac{6}{20}$	$\frac{5}{20}$	88 and under	90	$26 \times \frac{10}{20}$	$\frac{8}{20}$		
53 and under	55	$15\frac{1}{2} \times \frac{6}{20}$	$\frac{5}{20}$	90 and under	92	$27 \times \frac{10}{20}$	$\frac{8}{20}$		
55 and under	56	$15\frac{1}{2} \times \frac{7}{20}$	$\frac{6}{20}$	92 and under	95	$28 \times \frac{10}{20}$	$\frac{8}{20}$		
56 and under	57	$16 \times \frac{7}{20}$	$\frac{6}{20}$	95 and under	98	$29 \times \frac{10}{20}$	$\frac{8}{20}$		
57 and under	58	$16\frac{1}{2} \times \frac{7}{20}$	$\frac{6}{20}$	98 and under	101	$30 \times \frac{10}{20}$	$\frac{8}{20}$		
58 and under	59	$17 \times \frac{7}{20}$	$\frac{6}{20}$	101 and under	105	$31 \times \frac{10}{20}$	$\frac{8}{20}$		
59 and under	60	$17\frac{1}{2} \times \frac{7}{20}$	$\frac{6}{20}$	105 and under	108	$32 \times \frac{10}{20}$	$\frac{8}{20}$		
60 and under	62	$17\frac{1}{2} \times \frac{8}{20}$	$\frac{7}{20}$	108 and under	110	$33 \times \frac{10}{20}$	$\frac{8}{20}$		
62 and under	63	$18 \times \frac{8}{20}$	$\frac{7}{20}$	110 and under	113	$34 \times \frac{10}{20}$	$\frac{8}{20}$		
63 and under	64	$18\frac{1}{2} \times \frac{8}{20}$	$\frac{7}{20}$	113 and under	116	$35 \times \frac{10}{20}$	$\frac{8}{20}$		
64 and under	65	$19 \times \frac{8}{20}$	$\frac{7}{20}$	116 and under	120	$36 \times \frac{10}{20}$	$\frac{8}{20}$		
65 and under	66	$19\frac{1}{2} \times \frac{8}{20}$	$\frac{7}{20}$						

framing and plating be increased in size to the satisfaction of the Committee.

be the minimum thickness of both webs and flanges.

*Two*  $2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{20} =$  *One*  $4\frac{1}{2} \times 3 \times \frac{7}{20}$  *Two*  $3\frac{1}{2} \times 3 \times \frac{9}{20} =$  *One*  $6 \times 4 \times \frac{10}{20}$

$3 \times 2\frac{1}{2} \times \frac{5}{20} = 5 \times 3 \times \frac{7}{20}$   $3\frac{1}{2} \times 3\frac{1}{2} \times \frac{9}{20} = 6 \times 4 \times \frac{10}{20}$

$3 \times 2\frac{1}{2} \times \frac{6}{20} = 5 \times 3 \times \frac{8}{20}$   $4 \times 3\frac{1}{2} \times \frac{5}{20} = 6 \times 4 \times \frac{10}{20}$

$3 \times 3 \times \frac{6}{20} = 5 \times 4 \times \frac{6}{20}$   $4 \times 3\frac{1}{2} \times \frac{9}{20} = 6 \times 5 \times \frac{10}{20}$

$3 \times 3 \times \frac{7}{20} = 5 \times 4 \times \frac{9}{20}$











# STEEL VESSELS.

Table of Minimum Dimensions of KEELS, STEMS,

NUMBERS. For Keel, Stem, Sternpost, and Plating. (See Section 2.)	Bar Keels for All Grades.	Stem of Sailing Vessels, and Steamers, and Sternpost of Sailing Vessels and Paddle Steamers.	Stern frames of Screw Steamers.	THICKNESS OF					
				Flat Plate Keels for all grades, breadth, and thickness.		Garboard Strakes, breadth and thickness.			
				Three-fifths length amidships.	Ends.	100A		90A	
	inches.	inches.	inches.	inches.		Half length amidships.	Ends.	Half length amidships.	Ends.
2600 and under 3300	$6 \times 1\frac{1}{8}$	$5\frac{1}{2} \times 1\frac{1}{8}$	$5\frac{1}{4} \times 2\frac{1}{4}$	$30 \times 8$	6	$30 \times 6$	6	$30 \times 6$	6
3300 and under 4200	$6\frac{1}{2} \times 1\frac{1}{8}$	$5\frac{3}{4} \times 1\frac{1}{8}$	$5\frac{3}{4} \times 2\frac{1}{2}$	$30 \times 8$	6	$30 \times 7$	7	$30 \times 6$	6
4200 and under 5100	$6\frac{3}{4} \times 1\frac{1}{4}$	$6 \times 1\frac{1}{4}$	$6 \times 2\frac{1}{2}$	$30 \times 9$	7	$30 \times 7$	7	$30 \times 6$	6
5100 and under 6000	$7 \times 1\frac{3}{8}$	$6 \times 1\frac{3}{8}$	$6 \times 3$	$31 \times 9$	8	$31 \times 8$	8	$31 \times 7$	7
6000 and under 6900	$7 \times 1\frac{1}{2}$	$6\frac{1}{4} \times 1\frac{1}{2}$	$6\frac{1}{4} \times 3$	$31 \times 10$	8	$31 \times 8$	8	$31 \times 7$	7
6900 and under 7700	$7 \times 1\frac{5}{8}$	$6\frac{1}{4} \times 1\frac{5}{8}$	$6\frac{1}{2} \times 3\frac{1}{4}$	$31 \times 11$	8	$31 \times 9$	8	$31 \times 8$	8
7700 and under 8500	$7 \times 1\frac{3}{4}$	$6\frac{1}{2} \times 1\frac{3}{4}$	$6\frac{1}{2} \times 3\frac{1}{2}$	$31 \times 12$	9	$31 \times 9$	8	$31 \times 8$	8
8500 and under 9300	$7\frac{1}{4} \times 1\frac{7}{8}$	$6\frac{1}{2} \times 1\frac{7}{8}$	$6\frac{1}{2} \times 3\frac{3}{4}$	$32 \times 12$	9	$32 \times 9$	8	$32 \times 8$	8
9300 and under 10100	$7\frac{1}{2} \times 1\frac{7}{8}$	$6\frac{3}{4} \times 1\frac{7}{8}$	$6\frac{3}{4} \times 4$	$32 \times 12$	9	$32 \times 9$	8	$32 \times 8$	8
10100 and under 10900	$7\frac{1}{2} \times 2$	$6\frac{3}{4} \times 2$	$6\frac{3}{4} \times 4\frac{1}{4}$	$32 \times 12$	9	$32 \times 9$	8	$32 \times 8$	8
10900 and under 11600	$7\frac{1}{2} \times 2\frac{1}{8}$	$7 \times 2\frac{1}{8}$	$7 \times 4\frac{1}{4}$	$33 \times 12$	9	$33 \times 9$	8	$33 \times 8$	8
11600 and under 12400	$7\frac{1}{2} \times 2\frac{1}{4}$	$7 \times 2\frac{1}{4}$	$7 \times 4\frac{1}{2}$	$33 \times 12$	9	$33 \times 10$	9	$33 \times 9$	8
12400 and under 13100	$8 \times 2\frac{1}{4}$	$7 \times 2\frac{1}{4}$	$7 \times 4\frac{3}{4}$	$33 \times 13$	10	$33 \times 10$	9	$33 \times 9$	8
13100 and under 13900	$8 \times 2\frac{1}{4}$	$7 \times 2\frac{1}{4}$	$7\frac{1}{4} \times 4\frac{3}{4}$	$34 \times 13$	10	$34 \times 10$	9	$34 \times 9$	8
13900 and under 14700	$8 \times 2\frac{3}{8}$	$7\frac{1}{4} \times 2\frac{3}{8}$	$7\frac{1}{2} \times 4\frac{3}{4}$	$34 \times 14$	11	$34 \times 11$	10	$34 \times 10$	9
14700 and under 15600	$8 \times 2\frac{3}{8}$	$7\frac{1}{2} \times 2\frac{3}{8}$	$8 \times 4\frac{3}{4}$	$35 \times 14$	11	$35 \times 11$	10	$35 \times 10$	9
15600 and under 16600	$8\frac{1}{2} \times 2\frac{3}{8}$	$8 \times 2\frac{3}{8}$	$8 \times 5$	$36 \times 14$	11	$36 \times 11$	10	$36 \times 10$	9
16600 and under 17600	$9 \times 2\frac{3}{8}$	$8\frac{1}{2} \times 2\frac{3}{8}$	$8\frac{1}{2} \times 5$	$36 \times 14$	11	$36 \times 11$	10	$36 \times 10$	9
17600 and under 18700	$9 \times 2\frac{1}{2}$	$8\frac{1}{2} \times 2\frac{1}{2}$	$8\frac{1}{2} \times 5$	$36 \times 16$	12	$36 \times 12$	11	$36 \times 11$	10



TABLE S 2.

STERN POSTS, AND OUTSIDE PLATING.

(For Nos. 18700 to 70000 see continuation.)

OUTSIDE PLATING IN  $\frac{1}{20}$  THS. OF AN INCH.

From Garboard to the lower edge of Sheerstrake.*				Sheerstrakes for all grades, breadth, and thickness.		From main to upper Sheerstrake in Spar-decked vessels.		Spar deck Sheerstrake, breadth and thickness.		Awning deck and Bridge Side Plating, also Poops, and Forecastles.
100A		90A		Half length amidships.	Ends.	Half length amidships.	Ends.	Half length amidships.	Ends.	
Half length amidships.	Ends.	Half length amidships.	Ends.	Half length amidships.	Ends.	Half length amidships.	Ends.	Half length amidships.	Ends.	
5 & 6	5	5	5	30 × 6	5	...	...	...	...	...
6	5	5 & 6	5	30 × 7	6	...	...	...	...	...
6 (a)	5	5 & 6 (a)	5	31 × 7	6	...	...	...	...	...
6 & 7	5 & 6	6	5	31 × 8	7	...	...	...	...	...
6 & 7 (a)	5 & 6	6 (a)	5	32 × 8	7	...	...	...	...	...
7	6	6 & 7	5 & 6	32 × 9	8	...	...	...	...	...
7 (a)	6	6 & 7 (a)	5 & 6	33 × 9	8	...	...	...	...	...
7 & 8	6 & 7	7	6	33 × 10	8	...	...	...	...	...
7 & 8 (b)	6 & 7	7 (b)	6	34 × 10	8	...	...	...	...	...
8	7	7 & 8	6 & 7	34 × 10	8	...	...	...	...	5
8 (b)	7	7 & 8 (b)	6 & 7	35 × 10	8	...7	...6	...8	...7	5
8 & 9	7 & 8	8	7	35 × 10	8	...	...	...	...	5
8 & 9 (b)	7 & 8	8 (b)	7	36 × 10	8	...	...	...	...	5
9	8	8 & 9	7 & 8	36 × 11	9	7	6	36 × 9	8	6
9 (b)	8	8 & 9 (b)	7 & 8	38 × 11	9	7	6	38 × 9	8	6
9 & 10	8	9	8	38 × 11	9	7	6	38 × 9	8	6
9 & 10 (b)	8	9 (b)	8	40 × 12	9	8	7	40 × 10	8	6
10	8	9 & 10	8	40 × 12	9	8	7	40 × 10	8	6
10 (b)	8	9 & 10 (b)	8	42 × 13	10	8	7	40 × 11	9	6

For foot notes—see continuation.



# STEEL VESSELS.

Table of Minimum Dimensions of KEELS,

NUMBERS. For Keel, Stem, Sternpost, and Plating. (See Section 2.)	Bar Keels for All Grades.	Stem or Sailing Vessels, and Steamers, and Sternpost of Sailing Vessels and Paddle Steamers.	Stern frames of Screw Steamers.	THICKNESS OF					
				Flat Plate Keels for all grades, breadth, and thickness.		Garboard Strakes, breadth and thickness.			
				Three-fifths length amidships.	Ends.	100A Half length amidships.	Ends.	90A Half length amidships.	Ends.
	inches.	inches.	inches.	inches.		inches.		inches.	
18700 and under 19900	$9\frac{1}{2} \times 2\frac{1}{2}$	$9 \times 2\frac{1}{2}$	$9 \times 5$	$36 \times 16$	12	$36 \times 12$	11	...	...
19900 and under 21300	$9\frac{1}{2} \times 2\frac{1}{2}$	$9 \times 2\frac{1}{2}$	$9 \times 5\frac{1}{2}$	$36 \times 16$	12	$36 \times 12$	11	...	...
21300 and under 22900	$10 \times 2\frac{1}{2}$	$10 \times 2\frac{1}{2}$	$10 \times 5\frac{1}{2}$	$36 \times 16$	12	$36 \times 12$	11	...	...
22900 and under 24600	$10 \times 2\frac{5}{8}$	$10 \times 2\frac{5}{8}$	$10 \times 6$	$36 \times 16$	12	$36 \times 12$	11	...	...
24600 and under 26500 <i>26000</i>	$10 \times 2\frac{3}{4}$	$10 \times 2\frac{3}{4}$	$10 \times 6$	$36 \times 16$	12	$36 \times 12$	11	...	...
26500 and under 28700	$10\frac{1}{2} \times 2\frac{3}{4}$	$10\frac{1}{2} \times 2\frac{3}{4}$	$11 \times 6$	$36 \times 16$	12	$36 \times 12$	11	...	...
28700 and under 31200	$11 \times 2\frac{3}{4}$	$11 \times 2\frac{3}{4}$	$11 \times 6\frac{1}{2}$	$36 \times 17$	13	$36 \times 13$	12	...	...
31200 and under 33900	$11 \times 2\frac{7}{8}$	$11 \times 2\frac{7}{8}$	$11 \times 6\frac{3}{4}$	$36 \times 17$	13	$36 \times 13$	12	...	...
33900 and under 36800	$11 \times 3$	$11 \times 3$	$11 \times 7$	$36 \times 18$	14	$36 \times 14$	13	...	...
36800 and under 40000	$11 \times 3\frac{1}{8}$	$11 \times 3\frac{1}{8}$	$11 \times 7\frac{1}{2}$	$36 \times 18$	14	$36 \times 14$	13	...	...
40000 and under 43400	$11\frac{1}{2} \times 3\frac{1}{8}$	$11\frac{1}{2} \times 3\frac{1}{8}$	$11\frac{1}{2} \times 7\frac{1}{2}$	$36 \times 18$	14	$36 \times 14$	13	...	...
43400 and under 47100	$12 \times 3\frac{1}{8}$	$12 \times 3\frac{1}{8}$	$12 \times 7\frac{3}{4}$	$36 \times 18$	14	$36 \times 14$	13	...	...
47100 and under 51000	$12 \times 3\frac{1}{4}$	$12 \times 3\frac{1}{4}$	$12\frac{1}{2} \times 7\frac{3}{4}$	$36 \times 20$	15	$36 \times 15$	14	...	...
51000 and under 55200	$12 \times 3\frac{3}{8}$	$12 \times 3\frac{3}{8}$	$13 \times 8$	$36 \times 20$	15	$36 \times 15$	14	...	...
55200 and under 59700	$12 \times 3\frac{1}{2}$	$12 \times 3\frac{1}{2}$	$13 \times 8\frac{1}{2}$	$36 \times 20$	15	$36 \times 15$	14	...	...
59700 and under 64600	$12 \times 3\frac{5}{8}$	$12 \times 3\frac{5}{8}$	$13 \times 9$	$36 \times 20$	15	$36 \times 15$	14	...	...
64600 and under 70000	$12 \times 3\frac{3}{4}$	$12 \times 3\frac{3}{4}$	$13 \times 9\frac{1}{2}$	$36 \times 21$	16	$36 \times 16$	15	...	...

MEM.—The Scantlings given in the above Table are intended for Vessels the length of which does not exceed *eleven times* their depth *from top of keel*, see Section 1. For Vessels which exceed this proportion, see Section 46 and Table S 6. For proportions of breadth to length, see Table S 5.



TABLE **S 2.**  
(Continued).

STEMS, STERN POSTS, AND OUTSIDE PLATING.

OUTSIDE PLATING IN $\frac{1}{20}$ THS. OF AN INCH.										
From Garboard to the lower edge of Sheerstrake.*				Sheerstrakes for all grades, breadth, and thickness.		From main to upper Sheerstrake in Spar-decked vessels.		Spar deck Sheerstrake, breadth and thickness.		Awning deck and Bridge Side Plating, also Poops, and Forecastsles.
100A		90A								
Half length amidships.	Ends.	Half length amidships.	Ends.	Half length amidships.	Ends.	Half length amidships.	Ends.	Half length amidships.	Ends.	
10 & 11	8 & 9	...	...	inches. 42 × 13	10	8	7	40 × 11	9	7
10 & 11 (b)	8 & 9	...	...	42 × 13	10	8	7	40 × 11	9	7
11	9	...	...	42 × 13	10	8	7	40 × 11	9	7
11 (b)	9	...	...	42 × 13	10	8	7	40 × 11	9	7
11 & 12	9	...	...	42 × 13	10	8	7	40 × 11	9	7
11 & 12 (e)	9	...	...	44 × 13	10	8	7	40 × 11	9	7
12	9	...	...	44 × 13	10	9	8	40 × 11	9	7
12 (e)	9	...	...	44 × 13	10	9	8	40 × 11	9	7
12 & 13	9 & 10	...	...	44 × 14	11	9	8	40 × 12	9	7
12 & 13 (e)	9 & 10	...	...	44 × 14	11	9	8	40 × 12	9	7
13	10	...	...	44 × 14	11	9	8	40 × 12	9	7
13 (e)	10	...	...	46 × 15	12	9	8	40 × 13	10	...
13 & 14	10 & 11	...	...	46 × 15	12	9	8	40 × 13	10	...
13 & 14 (e)	10 & 11	...	...	46 × 16	13	9	8	40 × 14	11	...
14	11	...	...	46 × 16	13	9	8	40 × 14	11	...
14 (e)	11	...	...	46 × 16	13	9	8	40 × 14	11	...
14 & 15	11 & 12	...	...	46 × 16	13	9	8	40 × 14	11	...

\* In the columns for plating, where two thicknesses are given they are to be worked in alternate strakes, and the larger thickness is to apply to the outer strakes, and the smaller one to the inner strakes: and the size of the rivets and double riveting to be regulated by the thickness of the thicker plating.

(a). One strake at Bilge increased  $\frac{1}{20}$  of an inch in thickness all fore and aft.

(b). Two strakes " "  $\frac{1}{20}$  " " " " " "

(c). Three " "  $\frac{1}{20}$  " " " " " "







# STEEL VESSELS.

Table of Minimum Dimensions of KEELSONS, KEELSON AN

Tonnage (See Section 2.) To register keelsons and collars and collars	Half length in feet and inches	Size of middle-line keelson standing upon floor and distance of floor to keelson inches	Thickness of keelson inches	Dimensions of angle iron for keelsons and collars in feet and inches	Dimensions of keelsons in feet and inches	Dimensions of collars in feet and inches	Dimensions of keelsons in feet and inches
Under 2800		$7\frac{1}{2} \times \frac{5}{8}$	$\frac{5}{16}$	$3 \times 3 \times \frac{5}{8}$	$3 \times 3 \times \frac{5}{8}$	$3 \times 3 \times \frac{5}{8}$	$3 \times 3 \times \frac{5}{8}$
2800 and 4100		$8\frac{1}{2} \times \frac{5}{8}$	$\frac{5}{16}$	$3 \times 3 \times \frac{5}{8}$	$3 \times 3 \times \frac{5}{8}$	$3 \times 3 \times \frac{5}{8}$	$3 \times 3 \times \frac{5}{8}$
4100 and 5100		$9 \times \frac{5}{8}$	$\frac{7}{16}$	$3 \times 3 \times \frac{5}{8}$	$3 \times 3 \times \frac{5}{8}$	$3 \times 3 \times \frac{5}{8}$	$3 \times 3 \times \frac{5}{8}$
5100 and 6700		$10 \times \frac{5}{8}$	$\frac{7}{16}$	$3 \times 3 \times \frac{5}{8}$	$3 \times 3 \times \frac{5}{8}$	$3 \times 3 \times \frac{5}{8}$	$3 \times 3 \times \frac{5}{8}$
6700 and 7800		$11 \times \frac{5}{8}$	$\frac{7}{16}$	$3\frac{1}{2} \times 3 \times \frac{5}{8}$	$3 \times 3 \times \frac{5}{8}$	$3 \times 3 \times \frac{5}{8}$	$3 \times 3 \times \frac{5}{8}$
7800 and 9100		$12 \times \frac{5}{8}$	$\frac{7}{16}$	$3\frac{1}{2} \times 3 \times \frac{5}{8}$	$3 \times 3 \times \frac{5}{8}$	$3 \times 3 \times \frac{5}{8}$	$3 \times 3 \times \frac{5}{8}$
9100 and 10300		$12 \times \frac{5}{8}$	$\frac{7}{16}$	$4 \times 3 \times \frac{5}{8}$	$3\frac{1}{2} \times 3 \times \frac{5}{8}$	$3\frac{1}{2} \times 3 \times \frac{5}{8}$	$3\frac{1}{2} \times 3 \times \frac{5}{8}$
10300 and 11400		$12 \times \frac{5}{8}$	$\frac{7}{16}$	$4\frac{1}{2} \times 3 \times \frac{5}{8}$	$3\frac{1}{2} \times 3 \times \frac{5}{8}$	$3\frac{1}{2} \times 3 \times \frac{5}{8}$	$3\frac{1}{2} \times 3 \times \frac{5}{8}$
11400 and 12800		$13 \times \frac{5}{8}$	$\frac{7}{16}$	$4\frac{1}{2} \times 3 \times \frac{5}{8}$	$3\frac{1}{2} \times 3 \times \frac{5}{8}$	$3\frac{1}{2} \times 3 \times \frac{5}{8}$	$3\frac{1}{2} \times 3 \times \frac{5}{8}$
12800 and 13800		$14 \times \frac{5}{8}$	$\frac{9}{16}$	$5 \times 3 \times \frac{5}{8}$	$3\frac{1}{2} \times 3 \times \frac{5}{8}$	$3\frac{1}{2} \times 3 \times \frac{5}{8}$	$3\frac{1}{2} \times 3 \times \frac{5}{8}$
13800 and 15100		$15 \times \frac{5}{8}$	$\frac{9}{16}$	$5 \times 3 \times \frac{5}{8}$	$3\frac{1}{2} \times 3 \times \frac{5}{8}$	$3\frac{1}{2} \times 3 \times \frac{5}{8}$	$3\frac{1}{2} \times 3 \times \frac{5}{8}$
15100 and 16500		$16 \times \frac{5}{8}$	$\frac{9}{16}$	$5 \times 3 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$
16500 and 18000		$17 \times \frac{5}{8}$	$\frac{9}{16}$	$5 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$
18000 and 19700		$18 \times \frac{5}{8}$	$\frac{11}{16}$	$5\frac{1}{2} \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$
19700 and 21700		$19 \times \frac{5}{8}$	$\frac{11}{16}$	$5\frac{1}{2} \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$
21700 and 24100		$20 \times \frac{5}{8}$	$\frac{11}{16}$	$6 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$
24100 and 27000		$20 \times \frac{5}{8}$	$\frac{11}{16}$	$6\frac{1}{2} \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$
27000 and 30400		$22 \times \frac{5}{8}$	$\frac{11}{16}$	$6\frac{1}{2} \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$
30400 and 34300		$23 \times \frac{5}{8}$	$\frac{11}{16}$	$6\frac{1}{2} \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$
34300 and 38200		$25 \times \frac{5}{8}$	$\frac{11}{16}$	$6\frac{1}{2} \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$
38200 and 43800		$27 \times \frac{5}{8}$	$\frac{11}{16}$	$6\frac{1}{2} \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$
43800 and 49600		$30 \times \frac{5}{8}$	$\frac{11}{16}$	$6\frac{1}{2} \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$
49600 and 56000		$30 \times \frac{5}{8}$	$\frac{11}{16}$	$6\frac{1}{2} \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$
56000 and 63900		$32 \times \frac{5}{8}$	$\frac{11}{16}$	$6\frac{1}{2} \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$
63900 and 70000		$32 \times \frac{5}{8}$	$\frac{11}{16}$	$6\frac{1}{2} \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$	$4 \times 4 \times \frac{5}{8}$



# STEEL VESSELS.

Table of Minimum Dimensions of KEELSONS, KEELSON AND

NUMBERS. To regulate keelsons stringers, decks, rudders, and ceiling. (See Section 2.)	Size of middle-line keelsons standing upon floors, and thickness of rider plate to keelson.		Thick- ness of inter- costal keel- son plates.	Dimensions of angle bars for keelsons, and stringers in hold, for all grades.	Dimensions of angle bar on the middle, lower or hold, and orlop beam stringer plates, on upper deck stringer plates in spar-decked, and awning-decked vessels.	Dimensions of angle bars on upper deck stringer plates.
	Half length amidships.	Thick- ness at ends.				
Under 2800	inches. $7\frac{1}{2} \times \frac{6}{20}$	inches. $\frac{5}{20}$	inches. $\frac{5}{20}$	inches. $3 \times 3 \times \frac{6}{20}$	inches. $3 \times 2\frac{1}{2} \times \frac{6}{20}$	inches. $3 \times 3 \times \frac{6}{20}$
2800 and under 4100	$8\frac{1}{2} \times \frac{7}{20}$	$\frac{6}{20}$	$\frac{5}{20}$	$3 \times 3 \times \frac{6}{20}$	$3 \times 3 \times \frac{6}{20}$	$3 \times 3 \times \frac{6}{20}$
4100 and under 5400	$9 \times \frac{8}{20}$	$\frac{7}{20}$	$\frac{5}{20}$	$3 \times 3 \times \frac{6}{20}$	$3 \times 3 \times \frac{6}{20}$	$3 \times 3 \times \frac{6}{20}$
5400 and under 6700	$10 \times \frac{8}{20}$	$\frac{7}{20}$	$\frac{5}{20}$	$3 \times 3 \times \frac{6}{20}$	$3 \times 3 \times \frac{6}{20}$	$3 \times 3 \times \frac{6}{20}$
6700 and under 7900	$11 \times \frac{9}{20}$	$\frac{7}{20}$	$\frac{6}{20}$	$3\frac{1}{2} \times 3 \times \frac{6}{20}$	$3 \times 3 \times \frac{6}{20}$	$3 \times 3 \times \frac{7}{20}$
7900 and under 9100	$12 \times \frac{9}{20}$	$\frac{7}{20}$	$\frac{6}{20}$	$3\frac{1}{2} \times 3 \times \frac{6}{20}$	$3 \times 3 \times \frac{6}{20}$	$3 \times 3 \times \frac{7}{20}$
9100 and under 10300	$12 \times \frac{9}{20}$	$\frac{7}{20}$	$\frac{6}{20}$	$4 \times 3 \times \frac{6}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{6}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$
10300 and under 11400	$12 \times \frac{10}{20}$	$\frac{8}{20}$	$\frac{7}{20}$	$4\frac{1}{2} \times 3 \times \frac{7}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$
11400 and under 12600	$13 \times \frac{10}{20}$	$\frac{8}{20}$	$\frac{7}{20}$	$4\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$	$4 \times 4 \times \frac{7}{20}$
12600 and under 13800	$14 \times \frac{11}{20}$	$\frac{9}{20}$	$\frac{7}{20}$	$5 \times 3\frac{1}{2} \times \frac{7}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$	$4 \times 4 \times \frac{8}{20}$
13800 and under 15100	$15 \times \frac{11}{20}$	$\frac{9}{20}$	$\frac{7}{20}$	$5 \times 3\frac{1}{2} \times \frac{8}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$	$4 \times 4 \times \frac{8}{20}$
15100 and under 16500	$16 \times \frac{12}{20}$	$\frac{10}{20}$	$\frac{8}{20}$	$5 \times 3\frac{1}{2} \times \frac{9}{20}$	$4 \times 4 \times \frac{8}{20}$	$4\frac{1}{2} \times 4\frac{1}{2} \times \frac{9}{20}$
16500 and under 18000	$17 \times \frac{12}{20}$	$\frac{10}{20}$	$\frac{8}{20}$	$5 \times 4 \times \frac{9}{20}$	$4 \times 4 \times \frac{9}{20}$	$4\frac{1}{2} \times 4\frac{1}{2} \times \frac{9}{20}$
18000 and under 19700	$18 \times \frac{13}{20}$	$\frac{11}{20}$	$\frac{8}{20}$	$5\frac{1}{2} \times 4 \times \frac{9}{20}$	$4 \times 4 \times \frac{9}{20}$	$4\frac{1}{2} \times 4\frac{1}{2} \times \frac{9}{20}$
19700 and under 21700	$19 \times \frac{13}{20}$	$\frac{11}{20}$	$\frac{8}{20}$	$5\frac{1}{2} \times 4 \times \frac{9}{20}$	$4 \times 4 \times \frac{9}{20}$	$4\frac{1}{2} \times 4\frac{1}{2} \times \frac{9}{20}$
21700 and under 24100	$20 \times \frac{13}{20}$	$\frac{11}{20}$	$\frac{9}{20}$	$6 \times 4 \times \frac{9}{20}$	$4 \times 4 \times \frac{9}{20}$	$4\frac{1}{2} \times 4\frac{1}{2} \times \frac{10}{20}$
24100 and under 27000	$20 \times \frac{14}{20}$	$\frac{12}{20}$	$\frac{9}{20}$	$6\frac{1}{2} \times 4 \times \frac{9}{20}$	$4 \times 4 \times \frac{9}{20}$	$4\frac{1}{2} \times 4\frac{1}{2} \times \frac{10}{20}$
27000 and under 30400	$22 \times \frac{14}{20}$	$\frac{12}{20}$	$\frac{9}{20}$	$6\frac{1}{2} \times 4 \times \frac{9}{20}$	$4 \times 4 \times \frac{9}{20}$	$4\frac{1}{2} \times 4\frac{1}{2} \times \frac{10}{20}$
30400 and under 34300	$23 \times \frac{14}{20}$	$\frac{12}{20}$	$\frac{9}{20}$	$6\frac{1}{2} \times 4\frac{1}{2} \times \frac{9}{20}$	$4 \times 4 \times \frac{9}{20}$	$4\frac{1}{2} \times 4\frac{1}{2} \times \frac{11}{20}$
34300 and under 38800	$25 \times \frac{14}{20}$	$\frac{12}{20}$	$\frac{9}{20}$	$6\frac{1}{2} \times 4\frac{1}{2} \times \frac{10}{20}$	$4 \times 4 \times \frac{9}{20}$	$4\frac{1}{2} \times 4\frac{1}{2} \times \frac{11}{20}$
38800 and under 43900	$27 \times \frac{14}{20}$	$\frac{12}{20}$	$\frac{9}{20}$	$6\frac{1}{2} \times 4\frac{1}{2} \times \frac{10}{20}$	$4 \times 4 \times \frac{9}{20}$	$5 \times 5 \times \frac{11}{20}$
43900 and under 49600	$29 \times \frac{14}{20}$	$\frac{13}{20}$	$\frac{9}{20}$	$6\frac{1}{2} \times 4\frac{1}{2} \times \frac{10}{20}$	$4 \times 4 \times \frac{9}{20}$	$5 \times 5 \times \frac{11}{20}$
49600 and under 56000	$30 \times \frac{15}{20}$	$\frac{13}{20}$	$\frac{9}{20}$	$6\frac{1}{2} \times 4\frac{1}{2} \times \frac{10}{20}$	$4 \times 4 \times \frac{9}{20}$	$5 \times 5 \times \frac{11}{20}$
56000 and under 63000	$32 \times \frac{15}{20}$	$\frac{13}{20}$	$\frac{9}{20}$	$6\frac{1}{2} \times 4\frac{1}{2} \times \frac{10}{20}$	$4 \times 4 \times \frac{9}{20}$	$5 \times 5 \times \frac{11}{20}$
63000 and under 70000	$32 \times \frac{15}{20}$	$\frac{13}{20}$	$\frac{9}{20}$	$6\frac{1}{2} \times 4\frac{1}{2} \times \frac{10}{20}$	$4 \times 4 \times \frac{9}{20}$	$5 \times 5 \times \frac{11}{20}$



RUDDER.				Thickness of Upper Deck.		Thickness of wood ceiling in hold, to upper part of bilges.	NUMBERS. To regulate keelsons, stringers, decks, rudders, and ceiling. (See Section 2.)
Sailing Vessels.		Steam Vessels.		(a)			
Diameter at the head.	Diameter at the heel & pintle.	Diameter at the head.	Diameter at the heel & pintle.	Wood.	Steel.		
inches.	inches.	inches.	inches.	inches.	inches.	inches.	
27 <sup>7</sup> / <sub>8</sub>	2	3	2	2 <sup>1</sup> / <sub>2</sub>	...	2	Under 2800
3	2	3 <sup>1</sup> / <sub>2</sub>	2	3	X...	2	2800 and under 4100
3 <sup>1</sup> / <sub>4</sub>	2	3 <sup>3</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>	3	...	2	4100 and under 5400
3 <sup>1</sup> / <sub>2</sub>	2	4	2 <sup>1</sup> / <sub>4</sub>	3	<sup>6</sup> / <sub>20</sub>	2	5400 and under 6700
3 <sup>3</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	<sup>6</sup> / <sub>20</sub>	2 <sup>1</sup> / <sub>2</sub>	6700 and under 7900
4	2 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>2</sub>	2 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	<sup>6</sup> / <sub>20</sub>	2 <sup>1</sup> / <sub>2</sub>	7900 and under 9100
4 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>2</sub>	2 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	<sup>6</sup> / <sub>20</sub>	2 <sup>1</sup> / <sub>2</sub>	9100 and under 10300
4 <sup>1</sup> / <sub>2</sub>	2 <sup>3</sup> / <sub>4</sub>	4 <sup>3</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	<sup>6</sup> / <sub>20</sub>	2 <sup>1</sup> / <sub>2</sub>	10300 and under 11400
4 <sup>3</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>4</sub>	5	3	3 <sup>1</sup> / <sub>2</sub>	<sup>6</sup> / <sub>20</sub>	2 <sup>1</sup> / <sub>2</sub>	11400 and under 12600
5	3	5 <sup>1</sup> / <sub>4</sub>	3	3 <sup>1</sup> / <sub>2</sub>	<sup>6</sup> / <sub>20</sub>	2 <sup>1</sup> / <sub>2</sub>	12600 and under 13800
5 <sup>1</sup> / <sub>4</sub>	3	5 <sup>1</sup> / <sub>2</sub>	3	3 <sup>1</sup> / <sub>2</sub>	<sup>6</sup> / <sub>20</sub>	2 <sup>1</sup> / <sub>2</sub>	13800 and under 15100
5 <sup>1</sup> / <sub>2</sub>	3	5 <sup>3</sup> / <sub>4</sub>	3	4	<sup>6</sup> / <sub>20</sub>	2 <sup>1</sup> / <sub>2</sub>	15100 and under 16500
6	3	6 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub>	4	<sup>6</sup> / <sub>20</sub>	2 <sup>1</sup> / <sub>2</sub>	16500 and under 18000
6 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub>	7	3 <sup>1</sup> / <sub>2</sub>	4	<sup>6</sup> / <sub>20</sub>	2 <sup>1</sup> / <sub>2</sub>	18000 and under 19700
6 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub>	4	<sup>6</sup> / <sub>20</sub>	2 <sup>1</sup> / <sub>2</sub>	19700 and under 21700
7	3 <sup>1</sup> / <sub>2</sub>	7 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	4	<sup>6</sup> / <sub>20</sub>	2 <sup>1</sup> / <sub>2</sub>	21700 and under 24100
7 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	8	4	4	<sup>6</sup> / <sub>20</sub>	2 <sup>1</sup> / <sub>2</sub>	24100 and under 27000
7 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>4</sub>	4	<sup>7</sup> / <sub>20</sub>	2 <sup>1</sup> / <sub>2</sub>	27000 and under 30400
8	4	9	4 <sup>1</sup> / <sub>2</sub>	4	...	2 <sup>1</sup> / <sub>2</sub>	30400 and under 34300
8 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>2</sub>	9 <sup>1</sup> / <sub>2</sub>	4 <sup>3</sup> / <sub>4</sub>	4	...	2 <sup>1</sup> / <sub>2</sub>	34300 and under 38800
...	...	10	5	4	...	2 <sup>1</sup> / <sub>2</sub>	38800 and under 43900
...	...	10 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>4</sub>	4	...	2 <sup>1</sup> / <sub>2</sub>	43900 and under 49600
...	...	10 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>4</sub>	4	...	2 <sup>1</sup> / <sub>2</sub>	49600 and under 56000
...	...	11	5 <sup>1</sup> / <sub>2</sub>	4	...	2 <sup>1</sup> / <sub>2</sub>	56000 and under 63000
...	...	11	5 <sup>1</sup> / <sub>2</sub>	4	...	2 <sup>1</sup> / <sub>2</sub>	63000 and under 70000

(a) When the deck is of Teak, it may be one-sixth less in thickness. Where a steel deck is substituted for a wood one, it is not to be less than as given above, and supported by beams as in the case of steel decks required by Table S 5. When the deck is of steel as required by the Rules, it is to be in thickness as given in Table S 5.

MEM.—The Scantlings given in the above Table are intended for Vessels, the length of which does not exceed *eleven times* their depth from top of keel, see Section 1. For Vessels which exceed this proportion, see Section 46 and Table S 6. For proportions of breadth to length, see Table S 5.

DIAMETER OF NUT AND SCREW BOLTS FOR FASTENING FLAT OF DECK.			
3 ins. and under	3 $\frac{1}{2}$ ins.	...	...
3 $\frac{1}{2}$ "	4 "	...	...
4 inches	...	...	...
			inch.
			$\frac{1}{2}$
			$\frac{9}{16}$
			$\frac{5}{8}$







# STEEL VESSELS.

No. of Vessel	Type	Main and Lower Deck Beams in "T" and Deck Beams			Upper Deck Beams in "T" and Deck Beams		
		Span of Beams	Depth of Beams	Length of Beams	Span of Beams	Depth of Beams	Length of Beams
16		12' x 3' x 3/8"					
18		12' x 3' x 3/8"					
20		12' x 3' x 3/8"					
22		12' x 3' x 3/8"					
24		12' x 3' x 3/8"					
26		12' x 3' x 3/8"					
28		12' x 3' x 3/8"					
30		12' x 3' x 3/8"					
32		12' x 3' x 3/8"					
34		12' x 3' x 3/8"					
36		12' x 3' x 3/8"					
38		12' x 3' x 3/8"					
40		12' x 3' x 3/8"					
42		12' x 3' x 3/8"					
44		12' x 3' x 3/8"					
46		12' x 3' x 3/8"					
48		12' x 3' x 3/8"					
50		12' x 3' x 3/8"					
52		12' x 3' x 3/8"					
54		12' x 3' x 3/8"					
56		12' x 3' x 3/8"					
58		12' x 3' x 3/8"					
60		12' x 3' x 3/8"					
62		12' x 3' x 3/8"					
64		12' x 3' x 3/8"					
66		12' x 3' x 3/8"					
68		12' x 3' x 3/8"					
70		12' x 3' x 3/8"					
72		12' x 3' x 3/8"					
74		12' x 3' x 3/8"					
76		12' x 3' x 3/8"					
78		12' x 3' x 3/8"					
80		12' x 3' x 3/8"					
82		12' x 3' x 3/8"					
84		12' x 3' x 3/8"					
86		12' x 3' x 3/8"					
88		12' x 3' x 3/8"					
90		12' x 3' x 3/8"					
92		12' x 3' x 3/8"					
94		12' x 3' x 3/8"					
96		12' x 3' x 3/8"					
98		12' x 3' x 3/8"					
100		12' x 3' x 3/8"					

These vessels are built to order and are available in various sizes and configurations. The dimensions listed are for the main and lower deck beams, and the upper deck beams. The vessels are built to meet the requirements of the U.S. Coast Guard and are suitable for use as cargo vessels, passenger vessels, and other types of vessels. The vessels are built to last and are designed to be safe and reliable. The vessels are built to meet the requirements of the U.S. Coast Guard and are suitable for use as cargo vessels, passenger vessels, and other types of vessels. The vessels are built to last and are designed to be safe and reliable.



# STEEL VESSELS.

Length of Beam amidships.	Upper and Lower Deck Beams in one and two decked vessels, Main and Lower Deck Beams in "Three deck" and spar-decked Vessels, and Beams of raised quarter decks.						Upper Deck Beams in "Three-deck" Vessels. (a)						Size of Spar deck Beam (a) all for and aft, and Forecastle Beams.
	Size of Beams amidships.			Size of Beams less than three-fourths the length of the mid-ship Beam.			Size of Beams amidships.			Size of Beams less than three-fourths the length of the mid-ship Beam.			
Feet.	Bulb Plate. ins. ins.	Single Angle Bars. ins. ins. ins.		Bulb Plate. ins. ins. ins.	Double Angle Bars. ins. ins. ins.		Bulb Plate. ins. ins. ins.	Double Angle Bars. ins. ins. ins.		Bulb Plate. ins. ins. ins.	Double Angle Bars. ins. ins. ins.		Bulb Plate. ins. ins.
16		$4\frac{1}{2} \times 3 \times \frac{6}{20}$											
18		$5 \times 3 \times \frac{7}{20}$											
20	$5 \times \frac{5}{20}$ Sng. Ang. Bar	$2 \times 2 \times \frac{5}{20}$ $5\frac{1}{2} \times 3 \times \frac{7}{20}$											
22	$5\frac{1}{2} \times \frac{5}{20}$	$2\frac{1}{2} \times 2\frac{1}{4} \times \frac{5}{20}$											
24	$6 \times \frac{6}{20}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{20}$		$5\frac{1}{2} \times \frac{5}{20}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{20}$								
26	$6\frac{1}{2} \times \frac{6}{20}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{6}{20}$		$6 \times \frac{6}{20}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{6}{20}$		$6 \times \frac{6}{20}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{20}$					$5\frac{1}{2} \times \frac{5}{20}$
28	$7 \times \frac{7}{20}$ $7\frac{1}{2} \times 5 \times 3 \times \frac{9}{20}$	$3 \times 3 \times \frac{6}{20}$		$6\frac{1}{2} \times \frac{6}{20}$	$3 \times 3 \times \frac{6}{20}$		$6\frac{1}{2} \times \frac{6}{20}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{6}{20}$		$6 \times \frac{6}{20}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{6}{20}$		$6 \times \frac{6}{20}$
30	$7\frac{1}{2} \times \frac{7}{20}$ $8 \times 3 \times 3 \times \frac{9}{20}$	$3 \times 3 \times \frac{6}{20}$		$7 \times \frac{7}{20}$	$3 \times 3 \times \frac{6}{20}$		$7 \times \frac{7}{20}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{6}{20}$		$6\frac{1}{2} \times \frac{6}{20}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{6}{20}$		$6\frac{1}{2} \times \frac{6}{20}$
32	$8 \times \frac{8}{20}$ $8 \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{10}{20}$	$3 \times 3 \times \frac{6}{20}$		$7 \times \frac{7}{20}$	$3 \times 3 \times \frac{6}{20}$		$7 \times \frac{7}{20}$	$3 \times 3 \times \frac{6}{20}$		$6\frac{1}{2} \times \frac{6}{20}$	$3 \times 3 \times \frac{6}{20}$		$6\frac{1}{2} \times \frac{6}{20}$
34	$8\frac{1}{2} \times \frac{8}{20}$ $9 \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{10}{20}$	$3 \times 3 \times \frac{7}{20}$		$7\frac{1}{2} \times \frac{7}{20}$	$3 \times 3 \times \frac{7}{20}$		$7\frac{1}{2} \times \frac{7}{20}$	$3 \times 3 \times \frac{6}{20}$		$7 \times \frac{7}{20}$	$3 \times 3 \times \frac{6}{20}$		$7 \times \frac{7}{20}$
36	$9 \times \frac{9}{20}$ $9 \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{11}{20}$	$3\frac{1}{2} \times 3 \times \frac{7}{20}$		$8 \times \frac{8}{20}$	$3\frac{1}{2} \times 3 \times \frac{7}{20}$		$8 \times \frac{8}{20}$	$3 \times 3 \times \frac{6}{20}$		$7\frac{1}{2} \times \frac{7}{20}$	$3 \times 3 \times \frac{6}{20}$		$7\frac{1}{2} \times \frac{7}{20}$
38	$9\frac{1}{2} \times \frac{9}{20}$ $10 \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{11}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$		$8\frac{1}{2} \times \frac{8}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$		$8\frac{1}{2} \times \frac{8}{20}$	$3\frac{1}{2} \times 3 \times \frac{7}{20}$		$8 \times \frac{8}{20}$	$3\frac{1}{2} \times 3 \times \frac{7}{20}$		$8 \times \frac{8}{20}$
40	$10 \times \frac{10}{20}$ $10 \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{13}{20}$ or $10\frac{1}{2}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$		$9 \times \frac{9}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$		$9 \times \frac{9}{20}$	$3\frac{1}{2} \times 3 \times \frac{7}{20}$		$8\frac{1}{2} \times \frac{8}{20}$	$3\frac{1}{2} \times 3 \times \frac{7}{20}$		$8\frac{1}{2} \times \frac{8}{20}$
42	$10\frac{1}{2} \times \frac{10}{20}$ $11 \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{13}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$		$9 \times \frac{9}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$		$9\frac{1}{2} \times \frac{9}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$		$9 \times \frac{9}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$		$9 \times \frac{9}{20}$
44	$11 \times \frac{10}{20}$ $11\frac{1}{2} \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{13}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$		$9\frac{1}{2} \times \frac{9}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$		$10 \times \frac{10}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$		$9\frac{1}{2} \times \frac{9}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$		$9\frac{1}{2} \times \frac{9}{20}$
46	$11\frac{1}{2} \times \frac{10}{20}$ $12 \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{13}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$		$10 \times \frac{10}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$		$10 \times \frac{10}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$		$9\frac{1}{2} \times \frac{9}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$		$9\frac{1}{2} \times \frac{9}{20}$
48	$12 \times \frac{10}{20}$ $12 \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{15}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$		$10\frac{1}{2} \times \frac{10}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$		$10\frac{1}{2} \times \frac{10}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$		$10 \times \frac{10}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$		$10 \times \frac{10}{20}$
50	$12 \times \frac{11}{20}$ $12\frac{1}{2} \times 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{15}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{9}{20}$		$11 \times \frac{10}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$		$11 \times \frac{10}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$		$10\frac{1}{2} \times \frac{10}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$		$10\frac{1}{2} \times \frac{10}{20}$

The size of all beams (with the exception of those of spar decks, awning decks, poops and forecastles), which are not less in length than three-fourths of the length of the midship beam, to be of the size given above for beams amidships; those of less length may be of the size given above, excepting those at hatchways exceeding in length four spaces of frames, mast and windlass beams, and beams under deck houses and the heel of bowsprit, which must not be less in size than the midship beam.

Strong beams in the machinery space must in all cases have double angle bars on their upper and lower edges.

No reduction is admitted at the ends of vessels in the size of spar and awning deck beams, and beams of poops and forecastles from those given above.

Where a poop, bridge, or forecabin is fitted on a spar deck, the beams may be one grade smaller than given above for poop, bridge, and forecabin beams.

The beams to fore and after peak tanks to be fitted to every frame, and to be of the size required for main deck beams at the ends of the vessel. Buttery beams, when substituted for bulb plate and double angles, may, except in the case of wide spaced strong hold beams be of the depth and thickness given for bulb beams in Table.



# BEAMS.

# TABLE S 4.

Size of Spar-deck Beams (a) all fore and aft, and Fore-castle Beams.	Size of Awning Deck Beams, Poop Beams, and Bridge Beams (a).		Hold Beams (b) of Extra Strength.		Beams on every frame where Steel or Iron Decks are fitted (c).		
	Bulb Plate.		Pit or Bulb Pit.		One, two & "Three deck" Vessels.		
Double Angle Bars. ins. ins. ins.	ins. ins.	Single Angle Bars. ins. ins. ins.	ins. ins.	Size of Angle Bars. ins. ins. ins.	Single Angle Bars. ins. ins. ins.	Spar deck. Single Angle Bars. ins. ins. ins.	Poop, Awning deck, Bridge, and Forecastle (d) Single Angle Bars. ins. ins. ins.
$4\frac{1}{2} \times 3 \times \frac{7}{20}$ Single Angle.							
$5 \times 3 \times \frac{7}{20}$ Single Angle.		$4\frac{1}{2} \times 3 \times \frac{6}{20}$			$4 \times 2\frac{1}{2} \times \frac{6}{20}$		
$5\frac{1}{2} \times 3 \times \frac{7}{20}$ Single Angle.		$5 \times 3 \times \frac{6}{20}$	$7 \times \frac{7}{20}$	$3 \times 3 \times \frac{6}{20}$	$5 \times 3 \times \frac{6}{20}$	$4 \times 2\frac{1}{2} \times \frac{6}{20}$	
$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{20}$		$5 \times 3 \times \frac{7}{20}$	$7\frac{1}{2} \times \frac{7}{20}$	$3 \times 3 \times \frac{7}{20}$	$5 \times 3 \times \frac{7}{20}$	$5 \times 3 \times \frac{6}{20}$	
$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{20}$		$5\frac{1}{2} \times 3 \times \frac{7}{20}$	$8 \times \frac{8}{20}$	$4 \times 3 \times \frac{7}{20}$	$5\frac{1}{2} \times 3 \times \frac{7}{20}$	$5 \times 3 \times \frac{7}{20}$	$4 \times 2\frac{1}{2} \times \frac{6}{20}$
$3 \times 2\frac{1}{2} \times \frac{5}{20}$		$6 \times 3 \times \frac{7}{20}$	$8\frac{1}{2} \times \frac{8}{20}$	$4 \times 3 \times \frac{7}{20}$	$5\frac{1}{2} \times 3 \times \frac{8}{20}$	$5\frac{1}{2} \times 3 \times \frac{7}{20}$	$4\frac{1}{2} \times 3 \times \frac{6}{20}$
$3 \times 3 \times \frac{5}{20}$		$6\frac{1}{2} \times 3 \times \frac{8}{20}$	$9 \times \frac{9}{20}$	$4 \times 3\frac{1}{2} \times \frac{8}{20}$	$5\frac{1}{2} \times 3 \times \frac{8}{20}$ Bulb Angle.	$5\frac{1}{2} \times 3 \times \frac{8}{20}$	$5 \times 3 \times \frac{6}{20}$
$3 \times 3 \times \frac{6}{20}$	$6 \times \frac{6}{20}$ Bulb Angle.	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{20}$ $6\frac{1}{2} \times 3 \times \frac{8}{20}$	$9\frac{1}{2} \times \frac{9}{20}$	$4 \times 4 \times \frac{8}{20}$	$6 \times 3 \times \frac{8}{20}$ Bulb Angle.	$5\frac{1}{2} \times 3 \times \frac{8}{20}$ Bulb Angle.	$5 \times 3 \times \frac{7}{20}$
$3 \times 3 \times \frac{6}{20}$	$6\frac{1}{2} \times \frac{6}{20}$ Bulb Angle.	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{6}{20}$ $7 \times 3 \times \frac{8}{20}$	$10 \times \frac{10}{20}$	$4 \times 4 \times \frac{9}{20}$	$6\frac{1}{2} \times 3 \times \frac{9}{20}$ Bulb Angle.	$6 \times 3 \times \frac{8}{20}$ Bulb Angle.	$5\frac{1}{2} \times 3 \times \frac{7}{20}$
$3 \times 3 \times \frac{6}{20}$	$7 \times \frac{7}{20}$ B.A.	$3 \times 2\frac{1}{2} \times \frac{6}{20}$ $7\frac{1}{2} \times 3 \times \frac{9}{20}$	$10\frac{1}{2} \times \frac{10}{20}$	$4\frac{1}{2} \times 4 \times \frac{9}{20}$	$7\frac{1}{2} \times 3 \times \frac{9}{20}$ Bulb Angle.	$6\frac{1}{2} \times 3 \times \frac{8}{20}$ Bulb Angle.	$6 \times 3 \times \frac{8}{20}$
$3 \times 3 \times \frac{6}{20}$	$7\frac{1}{2} \times \frac{7}{20}$ B.A.	$3 \times 3 \times \frac{6}{20}$ $8 \times 3 \times \frac{9}{20}$	$11 \times \frac{11}{20}$	$5 \times 4 \times \frac{9}{20}$	$7\frac{1}{2} \times 3 \times \frac{10}{20}$ Bulb Angle.	$7 \times 3 \times \frac{9}{20}$ Bulb Angle.	$6 \times 3 \times \frac{8}{20}$ Bulb Angle.
$3\frac{1}{2} \times 3 \times \frac{7}{20}$	$8 \times \frac{8}{20}$	$3 \times 3 \times \frac{6}{20}$ $8\frac{1}{2} \times 3 \times \frac{10}{20}$	$11\frac{1}{2} \times \frac{11}{20}$	$5 \times 4 \times \frac{9}{20}$	$8 \times 3 \times \frac{11}{20}$ Bulb Angle.	$7\frac{1}{2} \times 3 \times \frac{10}{20}$ Bulb Angle.	$6\frac{1}{2} \times 3 \times \frac{8}{20}$ Bulb Angle.
$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$	$8\frac{1}{2} \times \frac{8}{20}$	$3 \times 3 \times \frac{7}{20}$	$12 \times \frac{12}{20}$	$5\frac{1}{2} \times 4 \times \frac{9}{20}$	$8\frac{1}{2} \times 3 \times \frac{11}{20}$ $8\frac{1}{2} \times 3 \times \frac{12}{20}$ $9 \times 3 \times \frac{12}{20}$ Bulb Angle.		
$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$	$9 \times \frac{9}{20}$	$3\frac{1}{2} \times 3 \times \frac{7}{20}$	$12 \times \frac{12}{20}$	$6 \times 4 \times \frac{9}{20}$			
$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$	$9\frac{1}{2} \times \frac{9}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$	$13 \times \frac{13}{20}$	$6 \times 4 \times \frac{10}{20}$			
$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$	$10 \times \frac{9}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$	$13 \times \frac{13}{20}$	$6 \times 4 \times \frac{10}{20}$			

- (a) The beams at the ends of hatchways from six to ten spaces of frames in length, must be equal in size to those of the main deck; and in awning decks and long bridges to be of the size of spar deck beams.
- (b) These beams are to be formed of either a plate with double angle bars on its upper and lower edges, or a bulb plate with double angle bars and a covering plate on its upper edge. Tee beam plates and angle bars are to be of the sizes given above, and the broad flanges of the angle bars are to be fitted horizontally; the covering plate is to be of the thickness given for the angle bars. Strong beams at the spar deck in machinery space may be of the size of main deck beams of the same length, with double angle bars on their upper and lower edges of the size given for the corresponding beam, in "hold beams of extra strength." Semi-box beams may be adopted in lieu thereof, formed of bulb plate and single angle bars of the sizes given for ordinary beams, secured in the usual way to two consecutive frames, and plated over by plating six-twentieths of an inch in thickness.
- (c) Beams to every frame, when eight-twentieths of an inch thick or above, may be reduced one-twentieth of an inch in thickness, where less than three-fourths of the length of the amidship beam.
- (d) Bulb beams of the size required for spar deck beams to be fitted in way of windlass or capstan. The width of the bulb of bulb plates and tee bulbs to be 3½ times the thickness of the webs, and in bulb angles 2½ times the thickness of the webs.











# STEEL VESSELS.

## Table of Minimum Dimensions of STRINGER

PLATING NUMBERS OF VESSELS. (See Section 2.)	2000 to 3000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
Under 10 Depths, or Under 8 Breadths in Length.	$20 \times \frac{5}{20}$	$20 \times \frac{6}{20}$	$23 \times \frac{6}{20}$	$26 \times \frac{6}{20}$	$28 \times \frac{6}{20}$	$28 \times \frac{7}{20}$	$30 \times \frac{7}{20}$	$32 \times \frac{7}{20}$	$32 \times \frac{8}{20}$	$34 \times \frac{8}{20}$	$36 \times \frac{8}{20}$
10 to 11 Depths, or 8 to $8\frac{1}{2}$ Breadths.	$22 \times \frac{5}{20}$	$22 \times \frac{6}{20}$	$25 \times \frac{6}{20}$	$28 \times \frac{6}{20}$	$31 \times \frac{6}{20}$	$32 \times \frac{7}{20}$	$34 \times \frac{7}{20}$	$36 \times \frac{7}{20}$	$36 \times \frac{8}{20}$	$38 \times \frac{8}{20}$	$40 \times \frac{8}{20}$
11 to 12 Depths, or $8\frac{1}{2}$ to 9 Breadths.	$24 \times \frac{5}{20}$	$25 \times \frac{6}{20}$	$28 \times \frac{6}{20}$	$31 \times \frac{6}{20}$	$34 \times \frac{6}{20}$	$36 \times \frac{7}{20}$	$38 \times \frac{7}{20}$	$40 \times \frac{7}{20}$	$40 \times \frac{8}{20}$	$42 \times \frac{8}{20}$	$44 \times \frac{8}{20}$
12 to 13 Depths, or 9 to $9\frac{1}{2}$ Breadths.	$24 \times \frac{6}{20}$	$25 \times \frac{7}{20}$	$28 \times \frac{7}{20}$	$31 \times \frac{7}{20}$	$34 \times \frac{7}{20}$	$36 \times \frac{8}{20}$	$38 \times \frac{8}{20}$	$40 \times \frac{8}{20}$	$40 \times \frac{9}{20}$	$42 \times \frac{9}{20}$	$44 \times \frac{9}{20}$
13 to 14 Depths, or $9\frac{1}{2}$ to 10 Breadths.	$27 \times \frac{6}{20}$	$28 \times \frac{7}{20}$	$31 \times \frac{7}{20}$	$34 \times \frac{7}{20}$	$37 \times \frac{7}{20}$	$40 \times \frac{8}{20}$	$42 \times \frac{8}{20}$	$44 \times \frac{8}{20}$	$44 \times \frac{9}{20}$	$44 \times \frac{9}{20}$	$46 \times \frac{9}{20}$
14 to 15 Depths, or 10 to $10\frac{1}{2}$ Breadths.	$30 \times \frac{6}{20}$	$31 \times \frac{7}{20}$	$31 \times \frac{8}{20}$	$34 \times \frac{8}{20}$	$37 \times \frac{8}{20}$	$40 \times \frac{9}{20}$	$42 \times \frac{9}{20}$	$44 \times \frac{9}{20}$	$44 \times \frac{10}{20}$	$46 \times \frac{10}{20}$	$48 \times \frac{10}{20}$
15 to 16 Depths, or over $10\frac{1}{2}$ Breadths.	$33 \times \frac{6}{20}$	$34 \times \frac{7}{20}$	$34 \times \frac{8}{20}$	$38 \times \frac{8}{20}$	$40 \times \frac{8}{20}$	$44 \times \frac{9}{20}$	$46 \times \frac{9}{20}$	$48 \times \frac{9}{20}$	$48 \times \frac{10}{20}$	$50 \times \frac{10}{20}$	$52 \times \frac{10}{20}$
Ends of Stringer Plates.			$15 \times \frac{5}{20}$	$17 \times \frac{5}{20}$	$19 \times \frac{5}{20}$	$19 \times \frac{6}{20}$	$20 \times \frac{6}{20}$	$22 \times \frac{6}{20}$	$22 \times \frac{7}{20}$	$23 \times \frac{7}{20}$	$24 \times \frac{7}{20}$
Hold and Lower Deck Beam Stringer Plates (extreme breadth). <i>Ends of Ditto.</i>						$20 \times \frac{6}{20}$	$21 \times \frac{6}{20}$	$22 \times \frac{6}{20}$	$23 \times \frac{7}{20}$	$25 \times \frac{7}{20}$	$27 \times \frac{7}{20}$
						$16 \times \frac{5}{20}$	$16 \times \frac{5}{20}$	$17 \times \frac{5}{20}$	$18 \times \frac{6}{20}$	$19 \times \frac{6}{20}$	$21 \times \frac{6}{20}$
Tie Plate on Beams, Fore-and-aft, and Diagonals. <i>Ends of Ditto.</i>			$7 \times \frac{6}{20}$	$7 \times \frac{6}{20}$	$7 \times \frac{6}{20}$	$8 \times \frac{7}{20}$	$8 \times \frac{7}{20}$	$9 \times \frac{7}{20}$	$9 \times \frac{8}{20}$	$10 \times \frac{8}{20}$	$10 \times \frac{8}{20}$
			$7 \times \frac{5}{20}$	$7 \times \frac{5}{20}$	$7 \times \frac{5}{20}$	$8 \times \frac{6}{20}$	$8 \times \frac{6}{20}$	$9 \times \frac{6}{20}$	$9 \times \frac{7}{20}$	$10 \times \frac{7}{20}$	$10 \times \frac{7}{20}$

1. The depths for proportions to be taken from upper side of keel to top of upper deck beams in one, two, and three deck ships, and to top of main deck in spar and awning deck vessels; and, in spar decked vessels, two depths may be taken of the proportions, so that in a spar-decked vessel of thirteen and under fourteen depths in length, the stringers, &c., may be of the sizes given in the above Table for vessels of eleven and under twelve depths in length; and so on.

2. In two decked vessels the stringer plates indicated with regard to the vessel's proportions in the above Table are to be fitted to the upper deck beams.

3. In three decked vessels the stringer plates so indicated in the above Table are to be fitted to both upper and middle deck beams.

4. In spar decked vessels the stringer plates given in the above Table are to be fitted to the main deck beams; and the stringer plates required for the spar deck beams are to be the breadth of, and may be  $\frac{1}{20}$  of an inch less in thickness than the stringer plates given on the upper line of the Table for vessels of the same plating number, and may be reduced at their ends  $\frac{1}{20}$  of an inch in thickness, before and abaft the half length amidships, and to the breadth given for the ends of the main deck stringer plate in the Table.



# PLATES, STEEL DECKS AND TIE PLATES.

## TABLE S 5.

(For Nos. 27000 to 72000 see Continuation.)

13000	14000	15000	16000	17000	18000	19000	20000	21000	22000	23000	24000	25000
												Complete
$36 \times \frac{9}{20}$	$40 \times \frac{9}{20}$	$42 \times \frac{9}{20}$	$42 \times \frac{10}{20}$	$44 \times \frac{10}{20}$	$46 \times \frac{10}{20}$	$48 \times \frac{10}{20}$	$50 \times \frac{10}{20}$	$52 \times \frac{10}{20}$	$54 \times \frac{10}{20}$	$54 \times \frac{10}{20}$ Std Dk $\frac{6}{20}$	$56 \times \frac{10}{20}$ $\frac{1}{2}$ Len Amid	$58 \times \frac{10}{20}$ Std Dk $\frac{6}{20}$
$40 \times \frac{9}{20}$	$44 \times \frac{9}{20}$	$46 \times \frac{9}{20}$	$46 \times \frac{10}{20}$	$48 \times \frac{10}{20}$	$50 \times \frac{10}{20}$	$52 \times \frac{10}{20}$	$52 \times \frac{10}{20}$ Std Dk $\frac{6}{20}$	$54 \times \frac{10}{20}$ for $\frac{1}{2}$ Lgth	$56 \times \frac{10}{20}$ Amidships	$58 \times \frac{10}{20}$ Complete	$60 \times \frac{10}{20}$ Steel	$62 \times \frac{10}{20}$ Deck $\frac{6}{20}$
$44 \times \frac{9}{20}$	$48 \times \frac{9}{20}$	$50 \times \frac{9}{20}$	$46 \times \frac{10}{20}$ Steel Deck $\frac{6}{20}$	$48 \times \frac{10}{20}$ for Hlf Length	$50 \times \frac{10}{20}$ Amidships	$52 \times \frac{10}{20}$ Complete	$54 \times \frac{10}{20}$ Steel	$56 \times \frac{10}{20}$ Deck $\frac{6}{20}$	$58 \times \frac{10}{20}$ Complete	$60 \times \frac{10}{20}$ Steel	$62 \times \frac{10}{20}$ Deck $\frac{7}{20}$	$64 \times \frac{10}{20}$
$44 \times \frac{10}{20}$ Steel Deck $\frac{6}{20}$	$46 \times \frac{10}{20}$ for Hlf Length	$48 \times \frac{10}{20}$ Amidships	$50 \times \frac{10}{20}$ Complete	$52 \times \frac{10}{20}$ Steel	$54 \times \frac{10}{20}$ Deck $\frac{6}{20}$	$56 \times \frac{10}{20}$ Complete	$58 \times \frac{10}{20}$ Steel	$60 \times \frac{10}{20}$ Deck $\frac{7}{20}$	$62 \times \frac{10}{20}$ Complete	$64 \times \frac{10}{20}$ Steel	$66 \times \frac{10}{20}$ Deck $\frac{7}{20}$	$68 \times \frac{10}{20}$
$46 \times \frac{10}{20}$ Len Amids	$48 \times \frac{10}{20}$ Complete	$50 \times \frac{10}{20}$ Steel	$52 \times \frac{10}{20}$ Deck $\frac{6}{20}$	$54 \times \frac{10}{20}$ Complete	$56 \times \frac{10}{20}$ Steel	$58 \times \frac{10}{20}$ Deck $\frac{7}{20}$	$60 \times \frac{10}{20}$ Complete	$62 \times \frac{10}{20}$ Steel	$64 \times \frac{10}{20}$ Deck $\frac{7}{20}$	$66 \times \frac{10}{20}$ Upper and	$68 \times \frac{10}{20}$ Cpl Std $\frac{7}{20}$ Up Dk $\frac{7}{20}$	$70 \times \frac{10}{20}$ & Mdl $\frac{7}{20}$ Dk $\frac{1}{2}$ L $\frac{7}{20}$
$50 \times \frac{10}{20}$ Steel	$52 \times \frac{10}{20}$ Deck $\frac{6}{20}$	$54 \times \frac{10}{20}$ Complete	$56 \times \frac{10}{20}$ Steel	$58 \times \frac{10}{20}$ Deck $\frac{7}{20}$	$62 \times \frac{10}{20}$ Complete	$64 \times \frac{10}{20}$ Steel	$66 \times \frac{10}{20}$ Deck $\frac{7}{20}$	$68 \times \frac{10}{20}$ Complete	$70 \times \frac{10}{20}$ Steel	$72 \times \frac{10}{20}$ Upper and	$74 \times \frac{10}{20}$ Cpl Std $\frac{8}{20}$ Up Dk $\frac{8}{20}$	$76 \times \frac{10}{20}$ and Mdl $\frac{7}{20}$ Dk $\frac{1}{2}$ L $\frac{7}{20}$
$54 \times \frac{10}{20}$	$56 \times \frac{10}{20}$	$58 \times \frac{10}{20}$	$60 \times \frac{10}{20}$	$62 \times \frac{10}{20}$	$64 \times \frac{10}{20}$	$66 \times \frac{10}{20}$ Complete	$68 \times \frac{10}{20}$ Steel	$70 \times \frac{10}{20}$ Deck $\frac{7}{20}$	$72 \times \frac{10}{20}$ Complete	$74 \times \frac{10}{20}$ Steel	$76 \times \frac{10}{20}$ Upper and	$78 \times \frac{10}{20}$ Cpl Std $\frac{8}{20}$ Up Dk $\frac{8}{20}$
$24 \times \frac{8}{20}$	$26 \times \frac{8}{20}$	$28 \times \frac{8}{20}$	$28 \times \frac{8}{20}$	$29 \times \frac{8}{20}$	$30 \times \frac{8}{20}$	$31 \times \frac{8}{20}$	$32 \times \frac{8}{20}$	$33 \times \frac{8}{20}$	$35 \times \frac{8}{20}$	$36 \times \frac{8}{20}$	$36 \times \frac{8}{20}$	$37 \times \frac{8}{20}$
$28 \times \frac{8}{20}$	$29 \times \frac{8}{20}$	$30 \times \frac{8}{20}$	$31 \times \frac{9}{20}$	$32 \times \frac{9}{20}$	$33 \times \frac{9}{20}$	$34 \times \frac{9}{20}$	$35 \times \frac{9}{20}$	$37 \times \frac{9}{20}$	$38 \times \frac{9}{20}$	$39 \times \frac{9}{20}$	$40 \times \frac{9}{20}$	$41 \times \frac{9}{20}$
$22 \times \frac{7}{20}$	$23 \times \frac{7}{20}$	$24 \times \frac{7}{20}$	$24 \times \frac{8}{20}$	$25 \times \frac{8}{20}$	$26 \times \frac{8}{20}$	$26 \times \frac{8}{20}$	$27 \times \frac{8}{20}$	$28 \times \frac{8}{20}$	$29 \times \frac{8}{20}$	$30 \times \frac{8}{20}$	$31 \times \frac{8}{20}$	$32 \times \frac{8}{20}$
$10 \times \frac{9}{20}$	$11 \times \frac{9}{20}$	$12 \times \frac{9}{20}$	$12 \times \frac{10}{20}$	$13 \times \frac{10}{20}$	$13 \times \frac{10}{20}$	$13 \times \frac{10}{20}$	$14 \times \frac{10}{20}$	$14 \times \frac{10}{20}$	$15 \times \frac{10}{20}$	$15 \times \frac{10}{20}$	$15 \times \frac{10}{20}$	$16 \times \frac{10}{20}$
$10 \times \frac{8}{20}$	$11 \times \frac{8}{20}$	$12 \times \frac{8}{20}$	$12 \times \frac{8}{20}$	$13 \times \frac{8}{20}$	$13 \times \frac{8}{20}$	$13 \times \frac{8}{20}$	$14 \times \frac{8}{20}$	$14 \times \frac{8}{20}$	$15 \times \frac{8}{20}$	$15 \times \frac{8}{20}$	$15 \times \frac{8}{20}$	$16 \times \frac{8}{20}$

5. In *awning decked* vessels the stringer plates given in the above Table are to be fitted to the main deck beams, and the stringer plates required for the awning deck beams are to be of the same width as those given in the Table for hold beam stringer plates, and to be of the following thicknesses, viz. :-

In Vessels whose plating number is under 13,000, not less than  $\frac{6}{20}$  of an inch.

13,000 and under 18,000	"	"	$\frac{7}{20}$	"	"
18,000	"	24,000	"	"	$\frac{8}{20}$
24,000	"	31,000	"	"	$\frac{9}{20}$

6. All stringer plates are to maintain their midship breadth for one-half the vessel's length amidships; from thence the breadth may be gradually reduced to that given above for the ends of the vessel.



# STEEL VESSELS.

Table of Minimum Dimensions of STRINGER

PLATING NUMBERS OF VESSELS. (See Section 2.)	27000	28000	29000	31000	32000	34000	35000	36000	38000	39000
Under 10 depths, or Under 8 Breadths in Length,	60 × $\frac{1}{2}$ Complete	62 × $\frac{1}{2}$ Std Dk $\frac{6}{20}$	65 × $\frac{1}{2}$	68 × $\frac{1}{2}$ Complete	70 × $\frac{1}{2}$ Steel Deck	72 × $\frac{1}{2}$ $\frac{7}{20}$	Cmpl Steel Up Dk $\frac{7}{20}$ and Mid Dk $\frac{7}{20}$	Up Dk $\frac{7}{20}$ Cmpl Steel Lgth $\frac{7}{20}$	Cmpl Steel Upper and Middle	Upper Deck
10 to 11 Depths, or 8 to 8½ Breadths,	64 × $\frac{1}{2}$ Complete	66 × $\frac{1}{2}$ Complete	68 × $\frac{1}{2}$ Steel	70 × $\frac{1}{2}$ Deck $\frac{7}{20}$	72 × $\frac{1}{2}$	Cmpl Steel Up Dk $\frac{7}{20}$ & Mid Dk $\frac{7}{20}$	Up Dk $\frac{7}{20}$ Cmpl Steel Lgth $\frac{7}{20}$	Cmpl Steel Upper and Middle	Upper and Deck $\frac{7}{20}$	Cmpl Steel Upper
11 to 12 Depths, or 8½ to 9 Breadths.	66 × $\frac{1}{2}$ Complete	68 × $\frac{1}{2}$ Steel	70 × $\frac{1}{2}$ Deck $\frac{7}{20}$	Cmpl Steel Up Dk $\frac{7}{20}$ and Mid Dk $\frac{7}{20}$	Up Dk $\frac{7}{20}$ Upper and Lgth $\frac{7}{20}$	Cmpl Steel Up Dk $\frac{7}{20}$ Middle	Upper Deck $\frac{7}{20}$	and Deck $\frac{7}{20}$	Cmpl Steel Upper and Middle	Upper Middle
12 to 13 Depths, or 9 to 9½ Breadths.	Cmpl Steel Up Dk $\frac{7}{20}$ Deck $\frac{7}{20}$	Cmpl Steel Up Dk $\frac{7}{20}$ and Mid Dk $\frac{7}{20}$	Up Dk $\frac{7}{20}$ Upper and Lgth $\frac{7}{20}$	Cmpl Steel Up Dk $\frac{7}{20}$ Middle	Upper and Deck $\frac{7}{20}$	Cmpl Steel Up Dk $\frac{7}{20}$ and Middle	Upper Deck $\frac{7}{20}$	Deck $\frac{8}{20}$	Cmpl Steel Upper	Upper Deck
13 to 14 Depths, or 9½ to 10 Breadths.	Cmpl Steel Up Dk $\frac{7}{20}$ & Mid Dk $\frac{7}{20}$	Cmpl Steel Up Dk $\frac{7}{20}$ Middle	Upper and Deck $\frac{7}{20}$	Cmpl Steel Up Dk $\frac{8}{20}$ and Middle	Up Dk $\frac{8}{20}$ Deck $\frac{7}{20}$	Cmpl Steel Up Dk $\frac{8}{20}$ Middle	Upper Deck $\frac{8}{20}$	and Deck $\frac{8}{20}$	Cmpl Steel Upper	Upper Middle Dk
14 to 15 Depths, or 10 to 10½ Breadths.	Cmpl Steel Up Dk $\frac{7}{20}$ Mid Dk $\frac{7}{20}$	Cmpl Steel Up Dk $\frac{7}{20}$ and Mid Dk $\frac{7}{20}$	Up Dk $\frac{8}{20}$ Upper and thick	Cmpl Steel Up Dk $\frac{8}{20}$ Middle	Upper and Deck $\frac{8}{20}$	Cmpl Steel Up Dk $\frac{8}{20}$ and Middle	Upper Deck $\frac{8}{20}$	Deck $\frac{9}{20}$	Cmpl Steel Upper	Upper Deck $\frac{9}{20}$
15 to 16 Depths, or over 10½ Breadths.	Cmpl Steel Up Dk $\frac{8}{20}$ and Mid Dk $\frac{7}{20}$	Cmpl Steel Up Dk $\frac{8}{20}$ Middle Dk $\frac{8}{20}$	Upper and thick							
Ends of Stringer Plates.	38 × $\frac{8}{20}$	40 × $\frac{8}{20}$	41 × $\frac{8}{20}$	42 × $\frac{8}{20}$	43 × $\frac{8}{20}$	44 × $\frac{8}{20}$	45 × $\frac{9}{20}$	45 × $\frac{9}{20}$	46 × $\frac{9}{20}$	47 × $\frac{9}{20}$
Hold and Lower Deck Beam Stringer Plates (extreme breadth). Ends of ditto.	42 × $\frac{9}{20}$ 33 × $\frac{8}{20}$	43 × $\frac{9}{20}$ 33 × $\frac{8}{20}$	44 × $\frac{9}{20}$ 34 × $\frac{8}{20}$	45 × $\frac{9}{20}$ 35 × $\frac{8}{20}$	46 × $\frac{9}{20}$ 36 × $\frac{8}{20}$	47 × $\frac{9}{20}$ 36 × $\frac{8}{20}$	48 × $\frac{9}{20}$ 37 × $\frac{8}{20}$	50 × $\frac{9}{20}$ 38 × $\frac{8}{20}$	51 × $\frac{9}{20}$ 40 × $\frac{8}{20}$	52 × $\frac{9}{20}$ 41 × $\frac{8}{20}$
Tie Plates on Beams, Fore-and-aft, and Diagonals. Ends of ditto.	16 × $\frac{1}{2}$ 16 × $\frac{8}{20}$	17 × $\frac{1}{2}$ 17 × $\frac{8}{20}$	17 × $\frac{1}{2}$ 17 × $\frac{8}{20}$	18 × $\frac{1}{2}$ 18 × $\frac{8}{20}$	18 × $\frac{1}{2}$ 18 × $\frac{8}{20}$	19 × $\frac{1}{2}$ 19 × $\frac{8}{20}$	19 × $\frac{1}{2}$ 19 × $\frac{8}{20}$	20 × $\frac{1}{2}$ 20 × $\frac{8}{20}$	20 × $\frac{1}{2}$ 20 × $\frac{8}{20}$	21 × $\frac{1}{2}$ 21 × $\frac{8}{20}$

7. Where a reduction of  $\frac{2}{20}$ ths of an inch from the midship thickness is allowed for the ends, the stringer plates may be reduced  $\frac{1}{20}$ th of an inch in thickness for one-eighth of the vessel's length before and abaft the half length amidships, and from thence to the ends they may be reduced to the thickness required at ends.

8. Where there is a *steel deck* prescribed either for the entire length of the vessel, or for half the length amidships, it is to be fitted to the upper deck beams in two-decked vessels. In three-decked vessels and spar-decked vessels it may be fitted either to the upper or middle deck beams.

9. In way of a *steel deck* or *half-steel deck*, the stringer plates may be reduced in width to one inch for every seven feet of the length of the vessel, but the thickness is to be as given above, and at the ends of the vessel the stringer plates to be in accordance with the Table for "ends of stringer plates." Where more than one steel deck is required the stringer plates are to be of the breadth and thickness given in the Table.

10. Where a *steel deck* is prescribed in the Table to be fitted for one half the vessel's length amidships, it is to be maintained the full breadth of the vessel for that length, and then tapered gradually into the stringer plates for one-eighth the vessel's length at each end.



(Continued.)

11  
4  
12  
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14. Tie plates on all tiers of beams to be of the same thickness as the stringer plates of their respective decks.











# STEEL VESSELS.

Additions beyond the requirements contained in the to depth than in Vessels for which

Proportion of Depths to Length.	ITEMS.	PLATING									
		UNDER 10450									
Above 11 and not exceeding 12	1 Sheerstrake ... ..	1	Add	$\frac{1}{20}$	for	$\frac{1}{2}$	length	amidships	..	..	..
	2 Strake below Sheerstrake...	2	..	..	..	..	..	..	..	..	..
	3 Upper deck Stringer plate	3	..	..	..	..	..	..	..	..	..
	4 Middle line Keelson...	4	..	..	..	..	..	..	..	..	..
	5 Side Keelson ... ..	5	..	..	..	..	..	..	..	..	..
	6 Bilge Keelson ... ..	6	Add	Bulb	for	$\frac{1}{2}$	length	amidships	..	..	..
	7 Bilge Stringer...	7	..	..	..	..	..	..	..	..	..
	8 Bilge Plating ... ..	8	One	Strake	increased	$\frac{1}{20}$	for	$\frac{1}{2}$	length	amidships	..
Above 12 and not exceeding 13	1 Sheerstrake ... ..	1	Add	$\frac{3}{20}$	for	$\frac{3}{4}$	length	amidships	..	..	..
	2 Strake below Sheerstrake...	2	..	..	..	..	..	..	..	..	..
	3 Upper deck Stringer plate	3	..	..	..	..	..	..	..	..	..
	4 Middle line Keelson...	4	..	..	..	..	..	..	..	..	..
	5 Side Keelson ... ..	5	..	..	..	..	..	..	..	..	..
	6 Bilge Keelson ... ..	6	Add	Bulb	for	$\frac{3}{4}$	length	amidships	..	..	..
	7 Bilge Stringer...	7	..	..	..	..	..	..	..	..	..
	8 Bilge Plating ... ..	8	Two	Strakes	increased	$\frac{1}{20}$	for	$\frac{1}{2}$	length	amidships	..
Above 13 and not exceeding 14	1 Sheerstrake ... ..	1	Add	Doubling	18	inches	wide	for	$\frac{3}{4}$	length	amidships
	2 Strake below Sheerstrake...	2	..	..	..	..	..	..	..	..	..
	3 Upper deck Stringer Plate	3	..	..	..	..	..	..	..	..	..
	4 Middle line Keelson...	4	..	..	..	..	..	..	..	..	..
	5 Side Keelson ... ..	5	Double	Angle	Keelson	to	be	fitted	in	all	cases
	6 Bilge Keelson ... ..	6	Add	Bulb	for	$\frac{3}{4}$	length	amidships	..	..	..
	7 Bilge Stringer...	7	Add	Bulb	for	$\frac{1}{2}$	length	amidships	..	..	..
	8 Bilge Plating ... ..	8	Two	Strakes	increased	$\frac{1}{20}$	for	$\frac{1}{2}$	length	amidships	..
Above 14 and not exceeding 15	1 Sheerstrake ... ..	1	Add	Doubling	20	inches	wide	for	$\frac{3}{4}$	length	amidships
	2 Strake below Sheerstrake...	2	..	..	..	..	..	..	..	..	..
	3 Upper deck Stringer plate	3	..	..	..	..	..	..	..	..	..
	4 Middle line Keelson...	4	..	..	..	..	..	..	..	..	..
	5 Side Keelson ... ..	5	Double	Angle	Keelson	and	Bulb	all	fore	and	aft
	6 Bilge Keelson ... ..	6	Add	Bulb	for	$\frac{3}{4}$	length	amidships	..	..	..
	7 Bilge Stringer...	7	Add	Bulb	for	$\frac{1}{2}$	length	&	Intercoastal	for	$\frac{1}{2}$
	8 Bilge Plating ... ..	8	One	Strake	doubled	for	$\frac{1}{2}$	length	amidships	in	lieu
Above 15 and not exceeding 16	1 Sheerstrake ... ..	1	..	..	..	..	..	..	..	..	..
	2 Strake below Sheerstrake...	2	..	..	..	..	..	..	..	..	..
	3 Second Strake below Sheerstrake	3	..	..	..	..	..	..	..	..	..
	4 Upper deck Stringer plate	4	..	..	..	..	..	..	..	..	..
	5 Middle line Keelson	5	..	..	..	..	..	..	..	..	..
	6 Side Keelson ... ..	6	..	..	..	..	..	..	..	..	..
	7 Bilge Keelson ... ..	7	..	..	..	..	..	..	..	..	..
	8 Bilge Stringer...	8	..	..	..	..	..	..	..	..	..

For all Vessels exceeding in length sixteen depths to the Middle Deck, plans must be submitted for the approval of the Committee for giving the Vessels sufficient additional strength longitudinally; and all Vessels having a length of thirteen depths and above to the Upper Deck, are to have a substantial erection extending over the midship half length of the Vessel. See also Section 46.

Where Bulb plates are required they are to be of the size given in Table S 4, for the midship hold beams, or for main deck beams, in vessels with one deck.



Rules ; for Vessels of greater proportionate length  
the ordinary Scantlings are provided.

# TABLE S 6.

(For Nos. 18700 to 40000 see continuation.)

## NUMBERS.

10450 and under 15500						15500 and under 18700					
1	Add $\frac{1}{20}$	for $\frac{3}{8}$	length amidships	..	..	1	Add $\frac{1}{20}$	for $\frac{3}{8}$	length amidships	..	..
2	..	..	..	..	..	2	..	..	..	..	..
3	..	..	..	..	..	3	..	..	..	..	..
4	..	..	..	..	..	4	..	..	..	..	..
5	..	..	..	..	..	5	..	..	..	..	..
6	Add Bulb	for $\frac{1}{2}$	length amidships	..	..	6	Add Bulb	for $\frac{1}{2}$	length amidships	..	..
7	..	..	..	..	..	7	..	..	..	..	..
8	One Strake	increased $\frac{1}{20}$	for $\frac{1}{2}$	length amidships	..	8	One Strake	increased $\frac{1}{20}$	for $\frac{1}{2}$	length amidships	..
1	Add $\frac{2}{20}$	for $\frac{3}{8}$	length amidships	..	..	1	Add $\frac{2}{20}$	for $\frac{3}{8}$	length amidships	..	..
2	Add $\frac{1}{20}$	for $\frac{1}{2}$	length amidships	..	..	2	Add $\frac{1}{20}$	for $\frac{1}{2}$	length amidships	..	..
3	..	..	..	..	..	3	..	..	..	..	..
4	..	..	..	..	..	4	..	..	..	..	..
5	..	..	..	..	..	5	..	..	..	..	..
6	Add Bulb	for $\frac{3}{8}$	length amidships	..	..	6	Add Bulb	for $\frac{3}{8}$	length amidships	..	..
7	..	..	..	..	..	7	..	..	..	..	..
8	Two Strakes	increased $\frac{1}{20}$	for $\frac{1}{2}$	length amidships	..	8	Two Strakes	increased $\frac{1}{20}$	for $\frac{1}{2}$	length amidships	..
1	Add Doubling	20 inches wide	for $\frac{3}{8}$	length amidships	..	1	Add Doubling	whole width	below Stringer	for $\frac{3}{8}$	length amids.
2	..	..	..	..	..	2	..	..	..	..	..
3	..	..	..	..	..	3	..	..	..	..	..
4	..	..	..	..	..	4	..	..	..	..	..
5	Add Intercostal	..	..	..	..	5	..	..	..	..	..
6	Add Bulb	for $\frac{3}{8}$	length amidships	..	..	6	Add Bulb	for $\frac{3}{8}$	length amidships	..	..
7	Add Bulb	for $\frac{1}{2}$	length where no hold beams	..	..	7	Add Intercostal	for $\frac{1}{2}$	length amidships, or	..	..
8	Two Strakes	increased $\frac{1}{20}$	for $\frac{1}{2}$	length amidships	..	8	Three Strakes	increased $\frac{1}{20}$	for $\frac{1}{2}$	length amidships	..
1	Add Doubling	whole width	below stringer	for $\frac{3}{8}$	length amids.	1	Add Doubling	whole width	below Stringer	for $\frac{3}{8}$	length amids.
2	..	..	..	..	..	2	..	..	..	..	..
3	..	..	..	..	..	3	Add $\frac{1}{20}$	for $\frac{1}{2}$	length amidships	..	..
4	..	..	..	..	..	4	..	..	..	..	..
5	Add Intercostal	..	..	..	..	5	..	..	..	..	..
6	Add Bulb	for $\frac{3}{8}$	length amidships	..	..	6	Add Bulb	for $\frac{3}{8}$	length amidships	..	..
7	Add Intercostal	for $\frac{1}{2}$	length amidships, or	..	..	7	Add Intercostal	for $\frac{1}{2}$	length amidships, or	..	..
8	One Strake	doubled	for $\frac{1}{2}$	length amidships	..	8	One Strake	doubled	for $\frac{1}{2}$	length amidships	..
1	Add Doubling	whole width	below Stringer	for $\frac{3}{8}$	length amids.	1	Add Doubling	whole width	below Stringer	for $\frac{3}{8}$	length amids.
2	Add $\frac{1}{20}$	for $\frac{1}{2}$	length amidships	..	..	2	Add $\frac{2}{20}$	for $\frac{1}{2}$	length amidships	..	..
3	..	..	..	..	..	3	..	..	..	..	..
4	..	..	..	..	..	4	..	..	..	..	..
5	..	..	..	..	..	5	..	..	..	..	..
6	Add Intercostal	..	..	..	..	6	..	..	..	..	..
7	Add Bulb	for $\frac{3}{8}$	length amidships	..	..	7	Add Intercostal	for $\frac{3}{8}$	length amidships	..	..
8	Add Intercostal	for $\frac{1}{2}$	length amidships, or	..	..	8	Add Intercostal	for $\frac{1}{2}$	length amidships, or	..	..
9	One Strake	doubled	for $\frac{1}{2}$	length amidships	..	9	One Strake	doubled	for $\frac{1}{2}$	length amidships	..

All vessels, excepting those with an awning deck, whose plating No. exceeds 35,000 and exceeding 16 depths in length taken from the main deck, are to have the whole of the reverse frames extended to the gunwale for half the vessel's length amidships, or a sufficient number of partial bulkheads fitted in the 'tween decks to the approval of the Committee. In the case of awning-decked vessels they are all to extend to the main deck.



# STEEL VESSELS.

Additions beyond the requirements contained in the to depth than in Vessels for which

Proportion of Depths to Length.	ITEMS.	PLATING			
		18700 and under 26000			
Above 11 and not exceeding 12	1 Sheerstrake ... ..	1 Add $\frac{2}{10}$ for $\frac{3}{4}$ length amidships .. ..	2 .. ..	3 .. ..	4 .. ..
	2 Strake below Sheerstrake...	2 .. ..	3 .. ..	4 .. ..	5 .. ..
	3 Upper deck Stringer plate .. ..	3 .. ..	4 .. ..	5 .. ..	6 Add Bulb for $\frac{2}{3}$ length amidships.. ..
	4 Middle line Keelson... ..	4 .. ..	5 .. ..	6 .. ..	7 .. ..
	5 Side Keelson ... ..	5 .. ..	6 Add Bulb for $\frac{2}{3}$ length amidships.. ..	7 .. ..	8 Two Strakes increased $\frac{1}{10}$ for $\frac{1}{2}$ length amidships .. ..
	6 Bilge Keelson ... ..	6 Add Bulb for $\frac{2}{3}$ length amidships.. ..	7 .. ..	8 .. ..	
	7 Bilge Stringer... ..	7 .. ..	8 .. ..		
	8 Bilge Plating ... ..	8 Two Strakes increased $\frac{1}{10}$ for $\frac{1}{2}$ length amidships .. ..			
Above 12 and not exceeding 13	1 Sheerstrake ... ..	1 Add $\frac{2}{10}$ for $\frac{3}{4}$ length amidships .. ..	2 Add $\frac{2}{10}$ for $\frac{1}{2}$ length amidships .. ..	3 .. ..	4 .. ..
	2 Strake below Sheerstrake...	2 Add $\frac{2}{10}$ for $\frac{1}{2}$ length amidships .. ..	3 .. ..	4 .. ..	5 .. ..
	3 Upper deck Stringer plate .. ..	3 .. ..	4 .. ..	5 .. ..	6 Add Bulb for $\frac{2}{3}$ length amidships.. ..
	4 Middle line Keelson... ..	4 .. ..	5 .. ..	6 Add Bulb for $\frac{2}{3}$ length amidships.. ..	7 Add Intercostal for $\frac{1}{2}$ length amidships, or .. ..
	5 Side Keelson ... ..	5 .. ..	6 Add Bulb for $\frac{2}{3}$ length amidships.. ..	7 Add Intercostal for $\frac{1}{2}$ length amidships, or .. ..	8 Three Strakes increased $\frac{1}{10}$ for $\frac{1}{2}$ length amidships .. ..
	6 Bilge Keelson ... ..	6 Add Bulb for $\frac{2}{3}$ length amidships.. ..	7 Add Intercostal for $\frac{1}{2}$ length amidships, or .. ..	8 Three Strakes increased $\frac{1}{10}$ for $\frac{1}{2}$ length amidships .. ..	
	7 Bilge Stringer... ..	7 Add Intercostal for $\frac{1}{2}$ length amidships, or .. ..	8 Three Strakes increased $\frac{1}{10}$ for $\frac{1}{2}$ length amidships .. ..		
	8 Bilge Plating ... ..	8 Three Strakes increased $\frac{1}{10}$ for $\frac{1}{2}$ length amidships .. ..			
Above 13 and not exceeding 14	1 Sheerstrake ... ..	1 Add Doubling whole width below Stringer for $\frac{3}{4}$ length amids.	2 .. ..	3 Add $\frac{1}{10}$ for $\frac{1}{2}$ length amidships .. ..	4 .. ..
	2 Strake below Sheerstrake...	2 .. ..	3 Add $\frac{1}{10}$ for $\frac{1}{2}$ length amidships .. ..	4 .. ..	5 .. ..
	3 Upper deck Stringer plate .. ..	3 Add $\frac{1}{10}$ for $\frac{1}{2}$ length amidships .. ..	4 .. ..	5 .. ..	6 Add Bulb for $\frac{2}{3}$ length amidships.. ..
	4 Middle line Keelson... ..	4 .. ..	5 .. ..	6 Add Bulb for $\frac{2}{3}$ length amidships.. ..	7 Add Intercostal for $\frac{1}{2}$ length amidships .. ..
	5 Side Keelson ... ..	5 .. ..	6 Add Bulb for $\frac{2}{3}$ length amidships.. ..	7 Add Intercostal for $\frac{1}{2}$ length amidships .. ..	8 .. ..
	6 Bilge Keelson ... ..	6 Add Bulb for $\frac{2}{3}$ length amidships.. ..	7 Add Intercostal for $\frac{1}{2}$ length amidships .. ..	8 .. ..	
	7 Bilge Stringer... ..	7 Add Intercostal for $\frac{1}{2}$ length amidships .. ..	8 .. ..		
	8 Bilge Plating ... ..	8 .. ..			
Above 14 and not exceeding 15	1 Sheerstrake ... ..	1 Add Doubling whole width below Stringer for $\frac{3}{4}$ length amids.	2 .. ..	3 Add $\frac{2}{10}$ for $\frac{1}{2}$ length amidships .. ..	4 To be $\frac{1}{4}$ deeper than in Table S 3. .. ..
	2 Strake below Sheerstrake...	2 .. ..	3 Add $\frac{2}{10}$ for $\frac{1}{2}$ length amidships .. ..	4 To be $\frac{1}{4}$ deeper than in Table S 3. .. ..	5 Add Bulb for $\frac{1}{2}$ length amidships.. ..
	3 Upper deck Stringer plate .. ..	3 Add $\frac{2}{10}$ for $\frac{1}{2}$ length amidships .. ..	4 To be $\frac{1}{4}$ deeper than in Table S 3. .. ..	5 Add Bulb for $\frac{1}{2}$ length amidships.. ..	6 Add Bulb for $\frac{2}{3}$ length amidships.. ..
	4 Middle line Keelson... ..	4 To be $\frac{1}{4}$ deeper than in Table S 3. .. ..	5 Add Bulb for $\frac{1}{2}$ length amidships.. ..	6 Add Bulb for $\frac{2}{3}$ length amidships.. ..	7 Add Intercostal for $\frac{1}{2}$ length amidships .. ..
	5 Side Keelson ... ..	5 Add Bulb for $\frac{1}{2}$ length amidships.. ..	6 Add Bulb for $\frac{2}{3}$ length amidships.. ..	7 Add Intercostal for $\frac{1}{2}$ length amidships .. ..	8 .. ..
	6 Bilge Keelson ... ..	6 Add Bulb for $\frac{2}{3}$ length amidships.. ..	7 Add Intercostal for $\frac{1}{2}$ length amidships .. ..	8 .. ..	
	7 Bilge Stringer... ..	7 Add Intercostal for $\frac{1}{2}$ length amidships .. ..	8 .. ..		
	8 Bilge Plating ... ..	8 .. ..			
Above 15 and not exceeding 16	1 Sheerstrake ... ..	1 Add Doubling whole width below Stringer for $\frac{3}{4}$ length amids.	2 Add Doubling whole width for $\frac{1}{2}$ length amidships .. ..	3 .. ..	4 Add $\frac{2}{10}$ for $\frac{1}{2}$ length amidships .. ..
	2 Strake below Sheerstrake ... ..	2 Add Doubling whole width for $\frac{1}{2}$ length amidships .. ..	3 .. ..	4 Add $\frac{2}{10}$ for $\frac{1}{2}$ length amidships .. ..	5 To be $\frac{1}{4}$ deeper than in Table S 3. .. ..
	3 Second Strake below Sheerstrake .. ..	3 .. ..	4 Add $\frac{2}{10}$ for $\frac{1}{2}$ length amidships .. ..	5 To be $\frac{1}{4}$ deeper than in Table S 3. .. ..	6 Add Bulb for $\frac{1}{2}$ length amidships.. ..
	4 Upper deck Stringer Plate .. ..	4 Add $\frac{2}{10}$ for $\frac{1}{2}$ length amidships .. ..	5 To be $\frac{1}{4}$ deeper than in Table S 3. .. ..	6 Add Bulb for $\frac{1}{2}$ length amidships.. ..	7 Add Bulb for $\frac{2}{3}$ length and Intercostal for $\frac{1}{2}$ length amidships .. ..
	5 Middle line Keelson... ..	5 To be $\frac{1}{4}$ deeper than in Table S 3. .. ..	6 Add Bulb for $\frac{1}{2}$ length amidships.. ..	7 Add Bulb for $\frac{2}{3}$ length and Intercostal for $\frac{1}{2}$ length amidships .. ..	8 Add Intercostal for $\frac{1}{2}$ length amidships .. ..
	6 Side Keelson ... ..	6 Add Bulb for $\frac{1}{2}$ length amidships.. ..	7 Add Bulb for $\frac{2}{3}$ length and Intercostal for $\frac{1}{2}$ length amidships .. ..	8 Add Intercostal for $\frac{1}{2}$ length amidships .. ..	9 .. ..
	7 Bilge Keelson ... ..	7 Add Bulb for $\frac{2}{3}$ length and Intercostal for $\frac{1}{2}$ length amidships .. ..	8 Add Intercostal for $\frac{1}{2}$ length amidships .. ..	9 .. ..	
	8 Bilge Stringer... ..	8 Add Intercostal for $\frac{1}{2}$ length amidships .. ..	9 .. ..		
	9 Bilge Plating ... ..	9 .. ..			

(a) Continuous plate Keelson standing on the floors and attached to Intercostal Keelson plates, having double angles on upper and lower edges of the sizes given in Table S 3, the plate to be of sufficient depth to take the deep flanges of the angles, and to be of the thickness given in Table S 3 for middle line Keelsons.

(b) Continuous plate Keelson standing on the floors and attached to Intercostal Keelson plates, having double angles on upper and lower edges of the sizes given in Table S 3, the plate to be three-fourths the depth given in Table S 3 for middle line Keelsons, and of the same thickness.



Rules ; for Vessels of greater proportionate length  
the ordinary Scantlings are provided.

TABLE S 6.  
(continued.)

NUMBERS.

26000 and under 35000	35000 and under 40000
1 Add $\frac{2}{30}$ for $\frac{3}{4}$ length amidships .. .. .	1 Add $\frac{2}{30}$ for $\frac{3}{4}$ length amidships .. .. .
2 Add $\frac{2}{30}$ for $\frac{1}{2}$ length amidships .. .. .	2 Add $\frac{2}{30}$ for $\frac{1}{2}$ length amidships .. .. .
3 .. .. .	3 .. .. .
4 .. .. .	4 .. .. .
5 Add Bulb for $\frac{1}{2}$ length amidships .. .. .	5 Add plate Keelson (K) for $\frac{1}{2}$ length amidships.. .. .
6 Add Bulb for $\frac{2}{3}$ length and Intercoastal for $\frac{1}{2}$ length amidships	6 Add Bulb for $\frac{2}{3}$ length and Intercoastal for $\frac{1}{2}$ length amids. ..
7 Add Intercoastal for $\frac{1}{2}$ length amidships .. .. .	7 Add Intercoastal for $\frac{2}{3}$ length amidships .. .. .
8 .. .. .	8 .. .. .
1 Add $\frac{2}{30}$ for $\frac{3}{4}$ length amidships .. .. .	1 Add Doubling whole width below Stringer for $\frac{3}{4}$ length amids.
2 Add $\frac{2}{30}$ for $\frac{1}{2}$ length amidships .. .. .	2 .. .. .
3 Add $\frac{2}{30}$ for $\frac{2}{3}$ length amidships .. .. .	3 Add $\frac{2}{30}$ for $\frac{2}{3}$ length amidships .. .. .
4 .. .. .	4 .. .. .
5 Add Bulb for $\frac{1}{2}$ length amidships.. .. .	5 Add plate Keelson (K) for $\frac{1}{2}$ length amidships.. .. .
6 Add Bulb for $\frac{2}{3}$ length and Intercoastal for $\frac{1}{2}$ length amidships	6 Add Bulb for $\frac{2}{3}$ length and Intercoastal for $\frac{1}{2}$ length amidships
7 Add Intercoastal for $\frac{1}{2}$ length amidships .. .. .	7 Add Intercoastal for $\frac{2}{3}$ length amidships .. .. .
8 .. .. .	8 .. .. .
1 Add Doubling whole width below Stringer for $\frac{3}{4}$ length amids.	1 Add Doubling whole width below Stringer for $\frac{3}{4}$ length amids.
2 .. .. .	2 Add Doubling whole width for $\frac{1}{2}$ length amidships .. .. .
3 Add $\frac{2}{30}$ for $\frac{2}{3}$ length amidships .. .. .	3 Add $\frac{2}{30}$ for $\frac{2}{3}$ length amidships .. .. .
4 To be $\frac{1}{4}$ deeper than in Table S 3. .. .. .	4 To be $\frac{1}{4}$ deeper than in Table S 3. .. .. .
5 Add Bulb for $\frac{1}{2}$ length amidships.. .. .	5 Add plate Keelson (K) for $\frac{1}{2}$ length amidships .. .. .
6 Add Bulb for $\frac{2}{3}$ length and Intercoastal for $\frac{1}{2}$ length amids. ..	6 Add Bulb for $\frac{2}{3}$ length and Intercoastal for $\frac{1}{2}$ length amids. ..
7 Add Intercoastal for $\frac{2}{3}$ length amidships .. .. .	7 Add Intercoastal for $\frac{2}{3}$ length amidships .. .. .
8 .. .. .	8 .. .. .
1 Add Doubling whole width below Stringer for $\frac{3}{4}$ length amids.	1 Add Doubling whole width below Stringer for $\frac{3}{4}$ length amids.
2 Add Doubling whole width for $\frac{1}{2}$ length amidships .. .. .	2 Add Doubling whole width for $\frac{1}{2}$ length amidships .. .. .
3 Add $\frac{2}{30}$ for $\frac{2}{3}$ length amidships .. .. .	3 Add Doubling 42 inches wide for $\frac{2}{3}$ length amidships.. .. .
4 To be $\frac{1}{4}$ deeper than in Table S 3. .. .. .	4 To be $\frac{1}{4}$ deeper than in Table S 3. .. .. .
5 Add plate Keelson (K) for $\frac{1}{2}$ length amidships.. .. .	5 Add plate Keelson (K) for $\frac{1}{2}$ length amidships.. .. .
6 Add Bulb for $\frac{2}{3}$ length and Intercoastal for $\frac{2}{3}$ length amids. ..	6 Add plate Keelson (K) for $\frac{1}{2}$ length amidships.. .. .
7 Add Intercoastal for $\frac{2}{3}$ length amidships .. .. .	7 Add Intercoastal for $\frac{2}{3}$ length amidships .. .. .
8 .. .. .	8 .. .. .
1 Add Doubling whole width below Stringer for $\frac{3}{4}$ length amids.	1 Add Doubling whole width below Stringer for $\frac{3}{4}$ length amids.
2 Add Doubling whole width for $\frac{2}{3}$ length amidships .. .. .	2 Add Doubling whole width for $\frac{2}{3}$ length amidships .. .. .
3 .. .. .	3 Add Doubling whole width for $\frac{1}{2}$ length amidships .. .. .
4 Add Doubling 40 inches wide for $\frac{1}{2}$ length amidships.. .. .	4 Add Doubling 50 inches wide for $\frac{2}{3}$ length amidships.. .. .
5 To be $\frac{1}{4}$ deeper than in Table S 3. .. .. .	5 To be $\frac{1}{4}$ deeper than in Table S 3. .. .. .
6 Add plate Keelson (K) for $\frac{1}{2}$ length amidships.. .. .	6 Add plate Keelson (K) for $\frac{1}{2}$ length amidships.. .. .
7 Add Bulb for $\frac{2}{3}$ length and Intercoastal for $\frac{2}{3}$ length amids. ..	7 Add plate Keelson (K) for $\frac{1}{2}$ length and Intl for $\frac{2}{3}$ lngth amids
8 Add Intercoastal for $\frac{2}{3}$ length amidships .. .. .	8 Add Intercoastal for $\frac{2}{3}$ length amidships .. .. .
9 .. .. .	9 .. .. .



NUMBER	NUMBER
35000 and under 40000	35000 and under 40000
1. Add 1/2 for 1 length unit	1. Add 1/2 for 1 length unit
2. Add 1/4 for 1 length unit	2. Add 1/4 for 1 length unit
3. Add 1/8 for 1 length unit	3. Add 1/8 for 1 length unit
4. Add 1/16 for 1 length unit	4. Add 1/16 for 1 length unit
5. Add 1/32 for 1 length unit	5. Add 1/32 for 1 length unit
6. Add 1/64 for 1 length unit	6. Add 1/64 for 1 length unit
7. Add 1/128 for 1 length unit	7. Add 1/128 for 1 length unit
8. Add 1/256 for 1 length unit	8. Add 1/256 for 1 length unit
9. Add 1/512 for 1 length unit	9. Add 1/512 for 1 length unit
10. Add 1/1024 for 1 length unit	10. Add 1/1024 for 1 length unit
11. Add 1/2048 for 1 length unit	11. Add 1/2048 for 1 length unit
12. Add 1/4096 for 1 length unit	12. Add 1/4096 for 1 length unit
13. Add 1/8192 for 1 length unit	13. Add 1/8192 for 1 length unit
14. Add 1/16384 for 1 length unit	14. Add 1/16384 for 1 length unit



# STEEL VESSELS.

## TABLE S 7.

Table of Scantlings for DOUBLE BOTTOMS CONSTRUCTED ON THE CELLULAR SYSTEM.

PLATING NUMBER FOR REGULATING SCANTLINGS. (See Section 2.)	Centre Girder. — Depth above Top of Keel and Thickness.	Thick- ness of Side Girders	Number of Side Girders (exclusive of Margin Plates) on each side, with Floors at alternate Frames.	Margin Plate. — Depth (exclusive of Flange) and Thickness.	Thickness of Inner Bottom Plating.			Thick- ness of Brack't or Floor Plates.	DIMENSIONS OF ANGLE BARS.		
					In Engine and Boiler Space, and Middle Line Strake, for Half Length Amidships (b)	Middle Line Strake at Ends.	Remain- der of Plating before and abaft the Engine and Boiler Space.		On Centre Girder. (a)	On Margin Plates.	On Side Girders, Intermediate, and Vertical Angle Bars.
	inches.	inches.		inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.
Under 11,000	$32 \times \frac{8}{20}$	$\frac{6}{20}$	2	$18 \times \frac{6}{20}$	$\frac{7}{20}$	$\frac{6}{20}$	$\frac{6}{20}$	$\frac{6}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$	$3 \times 3 \times \frac{7}{20}$	$3 \times 2\frac{1}{2} \times \frac{6}{20}$
11,000 and under 13,000	$33 \times \frac{8}{20}$	$\frac{6}{20}$	2	$19 \times \frac{7}{20}$	$\frac{8}{20}$	$\frac{6}{20}$	$\frac{6}{20}$	$\frac{6}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$	$3 \times 2\frac{1}{2} \times \frac{7}{20}$
13,000 and under 15,000	$34 \times \frac{8}{20}$	$\frac{6}{20}$	3	$20 \times \frac{7}{20}$	$\frac{8}{20}$	$\frac{7}{20}$	$\frac{7}{20}$	$\frac{6}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$	$3 \times 3 \times \frac{7}{20}$
15,000 and under 18,000	$35 \times \frac{9}{20}$	$\frac{7}{20}$	3	$21 \times \frac{7}{20}$	$\frac{8}{20}$	$\frac{7}{20}$	$\frac{7}{20}$	$\frac{7}{20}$	$4 \times 4 \times \frac{8}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$	$3 \times 3 \times \frac{7}{20}$
18,000 and under 21,000	$36 \times \frac{9}{20}$	$\frac{7}{20}$	3	$22 \times \frac{8}{20}$	$\frac{8}{20}$	$\frac{7}{20}$	$\frac{7}{20}$	$\frac{7}{20}$	$4 \times 4 \times \frac{9}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$	$3 \times 3 \times \frac{7}{20}$
21,000 and under 24,000	$38 \times \frac{10}{20}$	$\frac{7}{20}$	3	$24 \times \frac{8}{20}$	$\frac{9}{20}$	$\frac{8}{20}$	$\frac{7}{20}$	$\frac{7}{20}$	$4 \times 4 \times \frac{9}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$
24,000 and under 28,000	$40 \times \frac{10}{20}$	$\frac{7}{20}$	3	$26 \times \frac{8}{20}$	$\frac{9}{20}$	$\frac{8}{20}$	$\frac{7}{20}$	$\frac{7}{20}$	$4 \times 4 \times \frac{9}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{7}{20}$
28,000 and under 33,000	$42 \times \frac{10}{20}$	$\frac{8}{20}$	3	$28 \times \frac{8}{20}$	$\frac{10}{20}$	$\frac{8}{20}$	$\frac{8}{20}$ to $\frac{7}{20}$	$\frac{8}{20}$	$4 \times 4 \times \frac{9}{20}$	$4 \times 4 \times \frac{9}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$
33,000 and under 38,000	$44 \times \frac{10}{20}$	$\frac{8}{20}$	4	$30 \times \frac{9}{20}$	$\frac{10}{20}$	$\frac{8}{20}$	$\frac{8}{20}$ to $\frac{7}{20}$	$\frac{8}{20}$	$4 \times 4 \times \frac{9}{20}$	$4 \times 4 \times \frac{9}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{20}$
38,000 and under 44,000	$46 \times \frac{11}{20}$	$\frac{8}{20}$	4	$32 \times \frac{10}{20}$	$\frac{10}{20}$	$\frac{8}{20}$	$\frac{8}{20}$	$\frac{9}{20}$ to $\frac{8}{20}$	$4 \times 4 \times \frac{10}{20}$	$4 \times 4 \times \frac{10}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{9}{20}$
44,000 and under 51,000	$48 \times \frac{11}{20}$	$\frac{9}{20}$ to $\frac{8}{20}$	4	$34 \times \frac{10}{20}$	$\frac{11}{20}$	$\frac{9}{20}$	$\frac{9}{20}$ to $\frac{8}{20}$	$\frac{9}{20}$ to $\frac{8}{20}$	$4 \times 4 \times \frac{10}{20}$	$4 \times 4 \times \frac{10}{20}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{10}{20}$

(a) Where Flat Plate Keels are adopted, the Angles connecting the same to the centre Plate are to be of the size required for Middle Line Keelsons in Table S 3.

(b) The breadth of the Middle Line Strake of the Inner Bottom Plating to be not less than that given for Garboard Strakes in Table S 2.

Where Flanged Plates are adopted for Floors, Brackets, Intercoastal Plates, &c., as a substitute for fitting angles on the edges, such Plates are to be  $\frac{1}{16}$  inch thicker than that given in the Table, and the *facing surface* should not be less than the breadth of the flange of the angle required by the rule. The Floor plates and other parts of the inner bottom in the Boiler space  $\frac{1}{10}$ th of an inch thicker than given in the above Table.











# STEEL VESSELS.

Showing Diameters and Spacing of Rivets and

	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.
Thickness of PLATES .....	$\frac{5}{20}$	$\frac{6}{20}$	$\frac{6}{20}$ & $\frac{7}{20}$	$\frac{7}{20}$	$\frac{8}{20}$	$\frac{9}{20}$	$\frac{9}{20}$ & $\frac{10}{20}$	$\frac{10}{20}$
Diameter of RIVETS .....	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
Breadth of TREBLE riveted STRAPS in inches...	...	...	...	...	$14\frac{1}{4}$	$14\frac{1}{4}$	$14\frac{1}{4}$	16
"    "    DOUBLE    "    "    "    ...	8	8	$9\frac{3}{4}$	$9\frac{3}{4}$	$9\frac{3}{4}$	$9\frac{3}{4}$	$9\frac{3}{4}$	11
"    "    TREBLE    "    BUTT LAPS    "    ...	...	$6\frac{1}{2}$	...	...	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	9
"    "    DOUBLE    "    "    "    ...	$4\frac{1}{4}$	$4\frac{1}{4}$	5	5	5	5	5	6
"    "    DOUBLE    "    EDGE LAPS    "    ...	$3\frac{3}{4}$	$3\frac{3}{4}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	5
"    "    SINGLE    "    "    "    ...	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	...	...	...
MAXIMUM Spacing { In BUTTS of outside plating	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$2\frac{5}{8}$	3
of Rivets from { In EDGES (forward and aft)	$2\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{8}$	4
centre to centre { In FRAMES, REVERSED	$4\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{4}$	$5\frac{1}{4}$	$5\frac{1}{4}$	$5\frac{1}{4}$	$5\frac{1}{4}$	6
FRAMES, FLOORS, KEELSONS,								
and BEAM ANGLES.								

## Minimum Number of Rivets in Edges of Plating

	NUMBER OF RIVETS							
DIAMETER OF RIVETS.....	ins. $\frac{5}{8}$	ins. $\frac{5}{8}$	ins. $\frac{3}{4}$	ins. $\frac{3}{4}$	ins. $\frac{3}{4}$	ins. $\frac{3}{4}$	ins. $\frac{3}{4}$	ins. $\frac{3}{4}$
Spacing of FRAMES.....20 ins.....	7	7	5	5	5	5	...	...
"    "    "    .....21 "    .....	...	7	6	6	6	6	6	5
"    "    "    .....22 "    .....	...	...	6	6	6	6	6	5
"    "    "    .....23 "    .....	...	...	6	6	6	6	6	5
"    "    "    .....24 "    .....	...	...	7	7	7	7	7	6
"    "    "    .....25 "    .....	...	...	...	...	...	...	...	6
"    "    "    .....26 "    .....	...	...	...	...	...	...	...	...

Where the fore and aft flange of the frame does not exceed 3 inches, the rivets attaching the outside plating there should not exceed  $\frac{7}{8}$  inch in diameter, and where it is  $3\frac{1}{2}$  inches wide, they should not exceed 1 inch in diameter.

RIVETS to be  $\frac{1}{4}$  of an inch larger in diameter in the STEM, STERN FRAME, and KEEL, but in no case need these exceed  $1\frac{1}{4}$  inches in diameter, and to be spaced 5 diameters apart.

RIVETS in RUDDER to be of not less size than required for the upper edge of garboard strake amidship spaced not more than 5 diameters apart.

RIVETS connecting flat KEEL PLATES and the fore and aft ANGLES to be spaced not more than diameters apart.

Lloyd's Register of Shipping, 2, White Lion Court, Cornhill, London, E.C., 1st October, 1891.



Breadths of Straps, Lapped Butts and Edge Laps.

ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.
$\frac{11}{20}$	$\frac{12}{20}$	$\frac{12}{20} \& \frac{13}{20}$	$\frac{13}{20}$	$\frac{14}{20}$	$\frac{14}{20} \& \frac{15}{20}$	$\frac{15}{20}$	$\frac{16}{20}$
$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	1	1	1	1
$16\frac{3}{4}$	$16\frac{3}{4}$	$16\frac{3}{4}$	$16\frac{3}{4}$	19	19	19	19
$11\frac{1}{4}$	$11\frac{1}{4}$	$11\frac{1}{4}$	$11\frac{1}{4}$	...	...	...	...
9	9	9	9	$10\frac{1}{2}$	$10\frac{1}{2}$	$10\frac{1}{2}$	$10\frac{1}{2}$
6	6	6	6	...	...	...	...
$5\frac{1}{4}$	$5\frac{1}{4}$	$5\frac{1}{4}$	$5\frac{1}{4}$	6	6	6	6
...	...	...	...	...	...	...	...
$3\frac{1}{8}$	$3\frac{1}{8}$	$3\frac{1}{8}$	$3\frac{1}{8}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$
4	4	4	4	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$
$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	7	7	7	7

between Frames AMIDSHIPS.

IN EACH ROW.

ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.
$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	1	1	1	1
...	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...
5	5	5	5	...	...	...	...
5	5	5	5	5	5	5	5
6	6	6	6	5	5	5	5
6	6	6	6	5	5	5	5
...	...	6	6	5	5	5	5

RIVETS in the BUTTS of deck plating to be spaced 4 diameters, and in the edges 4 to  $4\frac{1}{2}$  diameters apart.

RIVETS in the BUTTS and EDGES of inner bottom plating, and in butts of girders, to be spaced not more than 4 diameters apart.

RIVETS in the LANDS and BUTTS of mast plates to be spaced 5 diameters apart.

Size of Countersink for Rivets in Outside Plating.	
Ins. $\frac{5}{8}$ Rivet	
$\frac{3}{4}$ Rivet	
$\frac{7}{8}$ Rivet	
1 Rivet	
$1\frac{1}{8}$ Rivet	



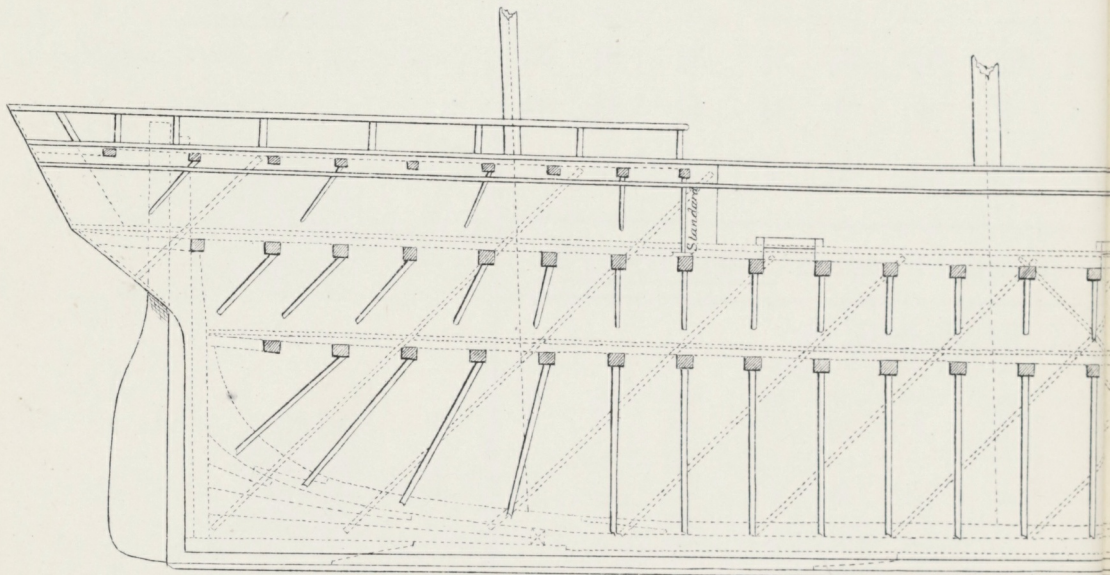








*A plan shewing the direction of the Iron Plates  
prescribed in the Plating*



168

140

120

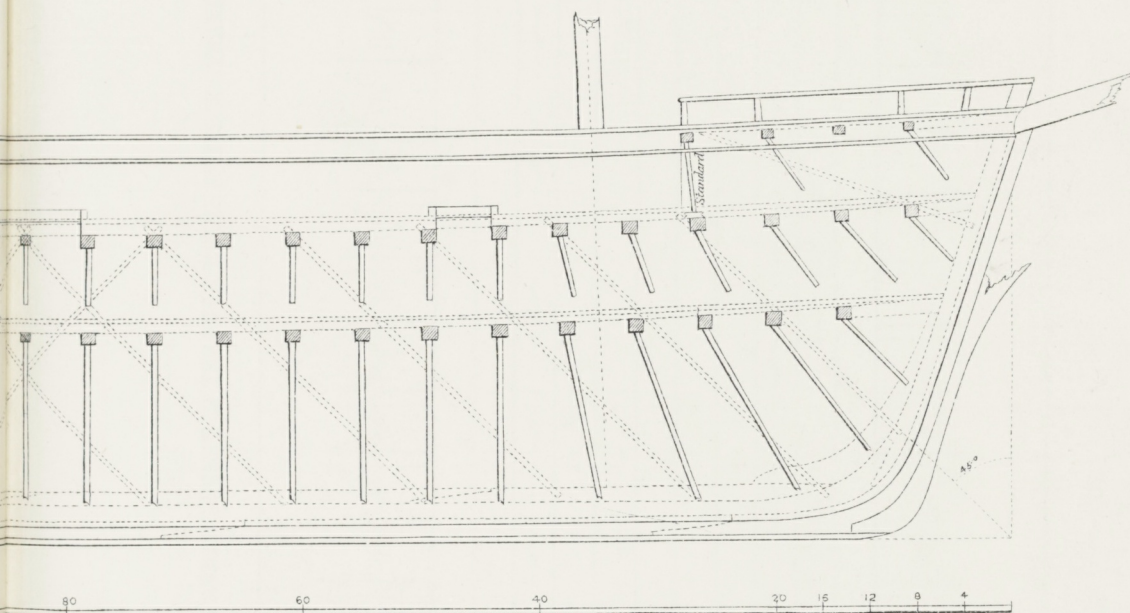
100

Scale of



# ISH AND FOREIGN SHIPPING.

*Plates on Frames, and Iron Knees and Riders.  
Sections 39 and 62.*

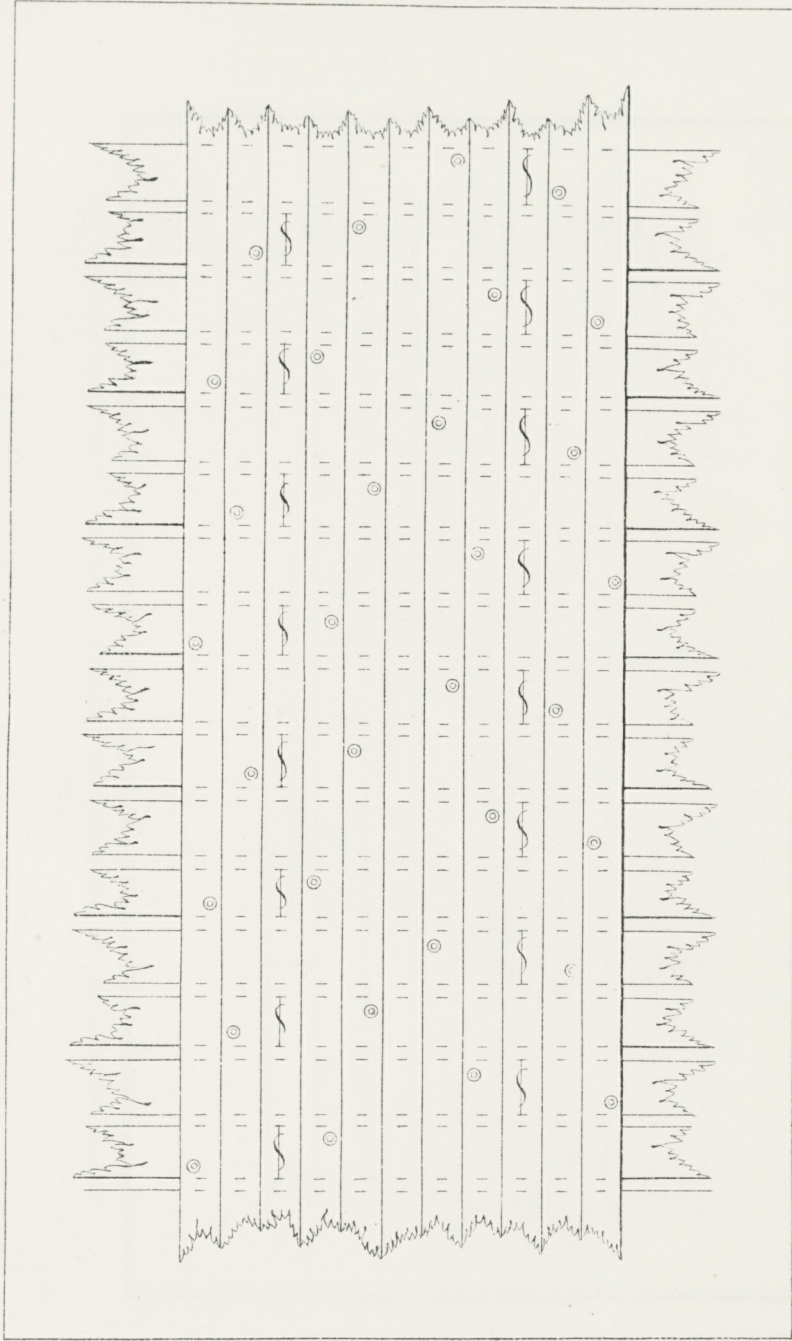




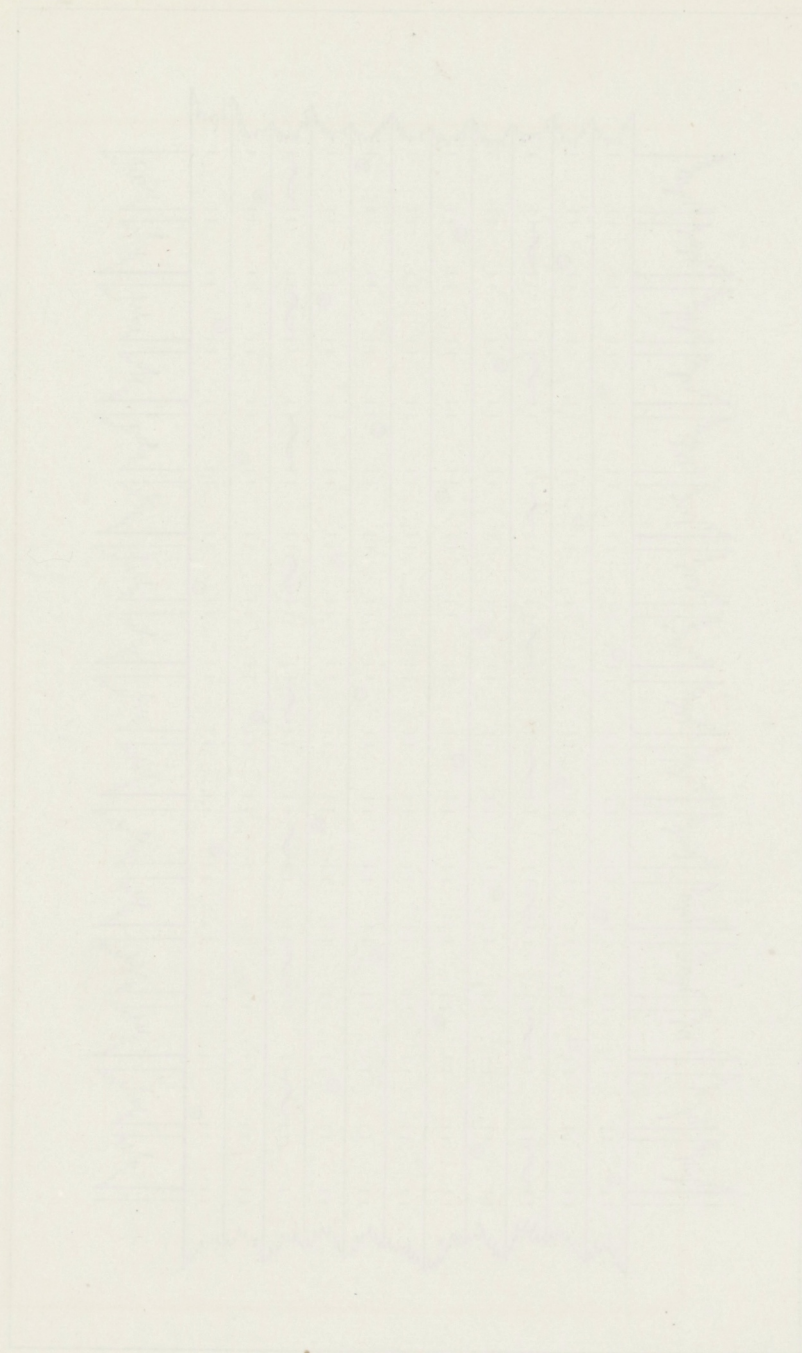




SKETCH SHOWING THE ARRANGEMENT OF THROUGH BOLTS IN THICK STRAKES OVER DOUBLE FLOORS - SECTION 39.

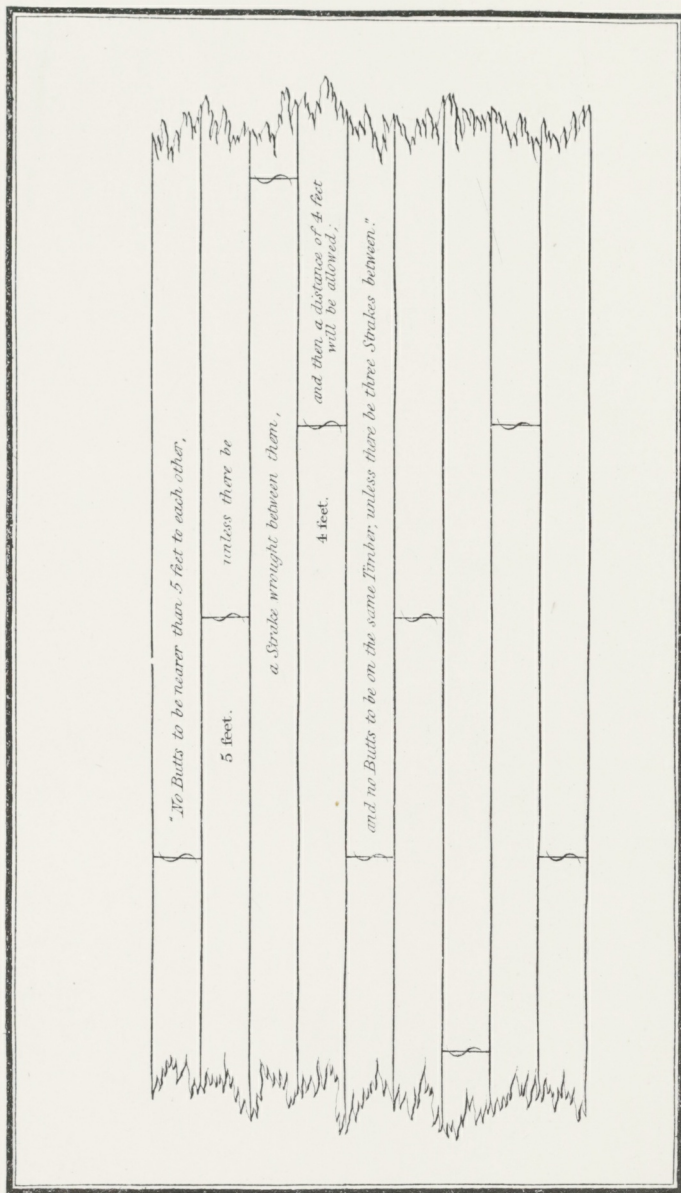








SKETCH DESCRIPTIVE OF THE REQUIRED SHIFTING OF PLANK.—Section 44. (See also Section 39)

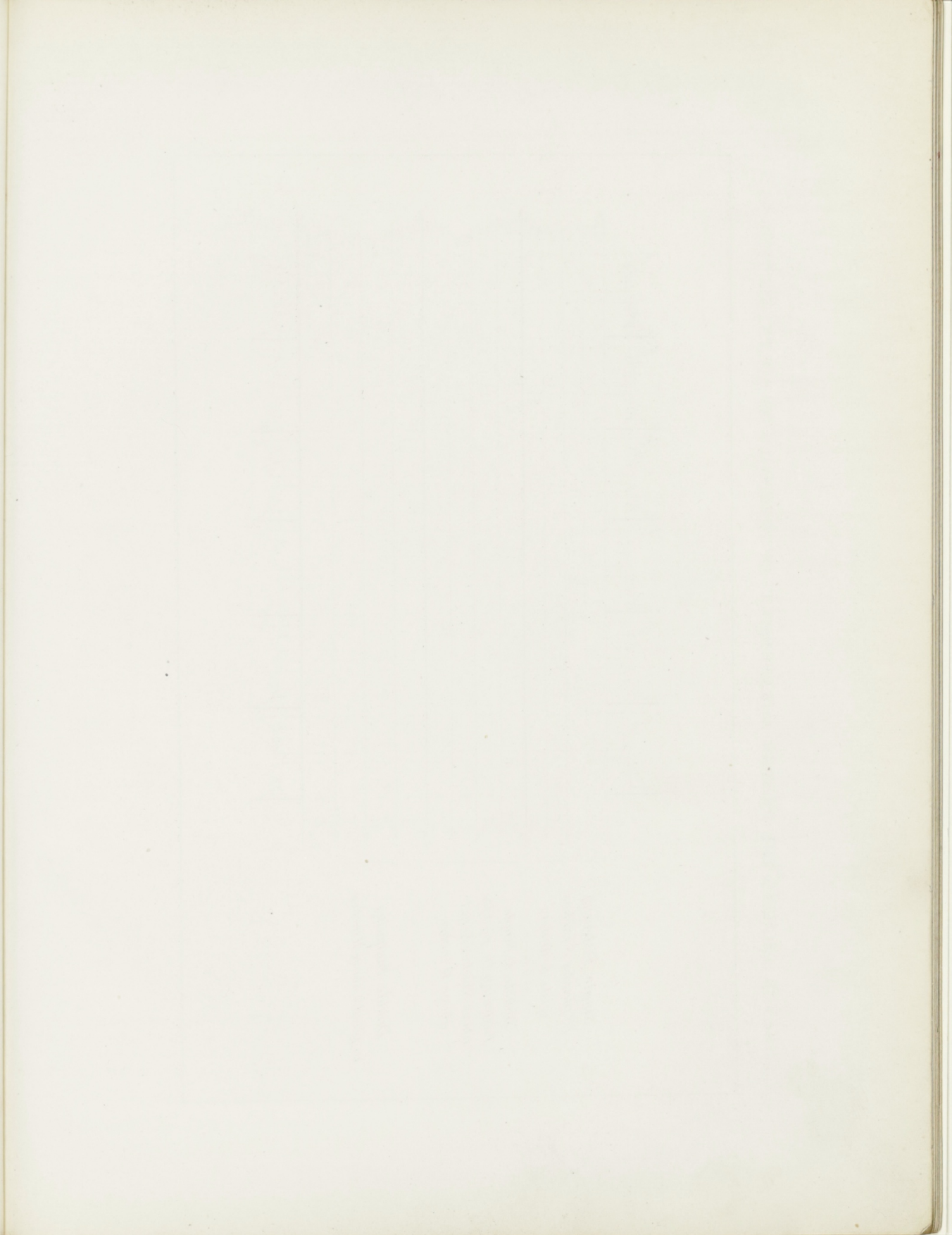


The Sketch shows the principle on which the Butts should be arranged, so as to avoid Stepping, which is deemed bad Workmanship.



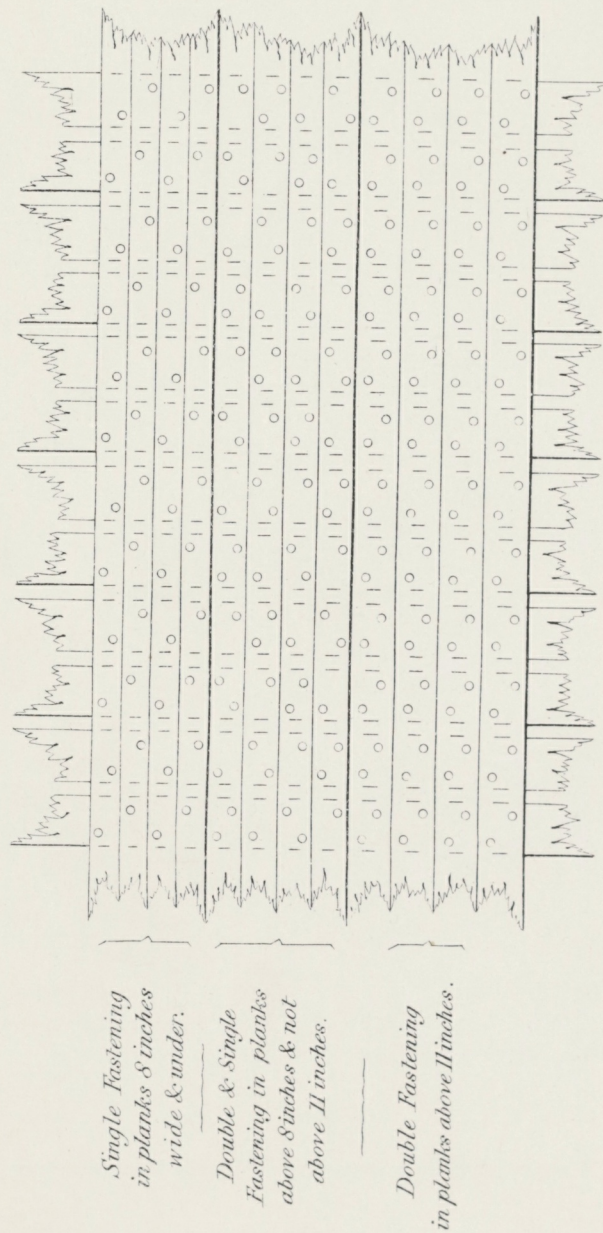








SKETCH SHOWING THE PROPER ARRANGEMENT OF TRENAILS OR BOLTS SECTION 46.









# WOOD VESSELS.

Exhibiting the Number of Years to be assigned to the different quality, properly seasoned

DESCRIPTION OF TIMBER.		TIMBERING.				
		Floors.	First Foothooks.	Second Foothooks.	Third Foothooks and Top Timbers.	Main Ribs Keelsons.
1	East-India Teak .....	16	16	16	16	16
2	English, African, and Live Oak, Adriatic, Italian, Spanish, Portuguese, and French Oak; Morung Saul, Greenheart, Morra, Iron Bark, and White Iron Bark .....	12	12	12	12	12
3	Cuba Sabicu, Pencil Cedar, Angelly, Vanatica, Jarrah Timber, Karri, Blue Gum, Red Gum, Box, Thingam, Puhutukawa, Molave, Dungon, Yacal, Mangachapuy, Betis, Ipil, Guijo, Narra, Batitinan, and Palomaria de Playa .....	10	10	10	10	10
4	Second-hand English, African, and Live Oak, Adriatic, Italian, Spanish, Portuguese, and French Oak; East-India Teak, Morung Saul, Greenheart, Morra, and Iron Bark (e) .....	8	8	7	7	7
5	Stringy Bark, and Red Cedar, Banaba and Philippine Islands Cedar .....	8	8	7	7	8
6	Danish Oak, other Continental White Oak, Mahogany of <i>Hard Texture</i> , Spanish Chestnut, Flooded Gum, Spotted Gum, Grey Gum, Turpentine, Black Butt, Tulip-wood, Tallow-wood, and Mulberry .....	*9	*9	9	9	*9
7	North American <i>White Oak</i> .....	*8	8	8	8	8
8	Pitch Pine, Oregon Pine, Huon Pine, Cowdie or Kaurie Pine, Larch, Hackmatack, Tamarac, and Juniper .....	*9	*9	9	9	*9
9	Dantzic, Memel, Riga, and American Red Pine .....	*8	*8	8	8	*8
10	English Ash .....	*8	*6	*5	*5	*5
11	Foreign Ash and Rock Maple .....	*8	—	—	—	—
12	American Rock Elm and Hickory .....	*7 (f)	*6	6	6	*7
13	European and American Grey Elm .....	*6	*6	6	6	6
14	Black Birch and Black Walnut .....	*7 (f)	*6 (f)	—	—	—
15	Spruce Fir, Swedish and Norway Red Pine, and Scotch Fir ..	*8	*8	8	8	8
16	Beech .....	*7 (f)	*6	—	—	—
17	Yellow Pine .....	—	—	—	*4	*4

- (a) This Table applies as to the Deadwood so far as regards the Materials to be used from the height of two feet above the rabbet of the Keel.
- (b) American Rock Elm allowed for Limber Strakes, Bilge Strakes, and Ceiling between them in Ships of the 9 years' grade, and under.
- (c) Yellow Pine allowed for Waterways of Upper Deck in Ships of the 8 years' grade, and under, if properly fastened as prescribed in Table B. and provided the Beams are well secured independently of the Waterways.
- (d) The Materials marked thus *d* under the head of "Rudder and Windlass," allowed in Ships of 300 Tons and under only.
- (e) In cases where second-hand Timber of the description named in line No. 4 is proposed to be used, application may be made to the Committee, who will appoint a special survey to be held thereon; and on a Report being received of its being of superior quality and of adequate size, a higher grade (not exceeding two years) may be allowed than as above set forth.
- (f) Black Birch, Beech, and American Rock Elm allowed for Floors amidships to an extent not exceeding three-fifths the entire length of the Keel in Ships of the 9 years' grade and under.
- Black Birch allowed for First Futtocks amidships to the same extent in Ships of the 8 years' grade.



TABLE **A.**

Prescriptions of Timber used in Ships, the same to be of good  
and free from defects.

TIMBERING.			Pall Bitt, Windlass, and Main Piece of Rudder.	OUTSIDE PLANK, &c.				INSIDE PLANK, &c.	
Transoms, Highheads, Timbers, Girders, and Saw'd (a) Stem and Stem Post.	Beams and Hooks.	Knees.		From top of Keel to two-fifths the depth of Hold	From two-fifths the depth of Hold to Wales.	Wales, Black- Strakes, Topsides, and Sheerstrakes.	Upper deck Waterway, Spirkettling, and Planksheers.	Shelves, Clamps, Limber and Bilge Strakes, Ceiling in hold and betwixt Decks, also Spirketting and Waterway below the Upper Deck.	
16	16	16	16	16	16	16	16	16	1
12	12	12	12	12	12	12	12	12	2
10	12	12	10	12	10	10	10	12	3
7	7	7	7	—	—	—	7	7	4
7	7	7	8	12	8	7	7	8	5
9	*9	*9	*9	*12	10	10	10	*10	6
8	8	*7	*9	*12	*8	8	8	8	7
9	*9	*9	*9 (a)	*12	10	10	*10	10	8
8	*8	*8	*6 (a)	*9	9	9	*10	9	9
*4	*5	*5	*5 (a)	*10	5	—	—	—	10
—	—	—	—	*8	6	—	—	*5	11
6	*7	6	*7	*12	7	6	6	7 (b)	12
6	6	6	—	*12	6	—	—	—	13
—	—	—	*6 (a)	*10	6	6	—	—	14
8	8	*8	—	*8	8	8	8	8	15
—	—	—	*6 (a)	*12	6	—	—	—	16
*4	*4	*4	—	*6	*5	*5	*5 (c)	*5	17

MEM.—The word "English" includes Timber the growth of the United Kingdom.

**SALTING.** All Ships built of the Timber above named, except those built wholly of Teak, will have one year added to their classification, if salted, provided it be done to the satisfaction of the Surveyors and as prescribed in Section 37 of the Rules; but Vessels built of the Materials contained in Lines 6 to 17 inclusive must be salted, or one year will be deducted from the term of years assigned on the Table, except where used for those parts indicated by an asterisk, thus: \*











# WOOD VESSELS.

TABLE

## Minimum Dimensions of TIMBER

TONNAGE (See Section 32) ..... TONS....	50	100	150	200	250	300	350	400	450	500	5
(a) TIMBER AND SPACE..... INCHES..	18	19	20	21½	23	24¼	25¾	27¼	28½	30	3
Floors, sided and moulded at Keelson, if squared	7	7½	8	8¾	9½	10¼	11	11¾	12¼	13	1
Double Floors, sided and moulded at Keelson, if squared.....	6	6½	7	7¾	8½	9¼	10	10½	11¼	12	1
(b) 1st Futtocks, sided and moulded at Floor-Heads, if squared .....	6	6½	7	7¾	8¼	8¾	9¼	10	10½	11	1
2nd Futtocks, sided, if squared .....	5½	6	6½	7	7½	8	8½	9	9½	10	1
3rd Futtocks and Long Top Timbers, sided, if squared.....	5½	5¾	6	6½	7	7¼	7¾	8¼	8½	9	1
Top Timbers (Short), sided, if squared .....	—	—	—	—	—	—	—	—	—	9	1
Top Timbers, moulded at heads, if squared ....	4	4½	4¾	5	5	5¼	5½	5¾	6	6	1
Breasthooks and Wing Transom, sided and moulded in the middle .....	8	8½	9	9¾	10¼	10¾	11¼	12	12½	13	1
(c) Keel, Stem, Apron, and Sternpost, sided and moulded .....	8	9	10	10¾	11¼	11¾	12¼	13	13½	14	1
Keelson, also the Mainpiece of Rudder from lower part of Counter upwards, sided and moulded	9	10	11	11¾	12¼	12¾	13¼	14	14½	15	1
(d) Wales .....	3	3½	4	4¼	4½	4¾	5¼	5¾	6	6	1
(e) Bottom Plank, from Keel to Wales .....	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4	1
Sheer Strks, Topsides, Up. Dk. Clamp where there is no Shelf fitted, & Low. Dk. Clamp with a Shelf	2¼	2½	3	3¼	3½	3¾	4	4¼	4½	5	1
Ceiling below Hold Beam Clamp .....	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	4	1
(f) Waterway, { Hardwood..... Fir .....	3½ 4	4 4½	4½ 5	5 5½	5 6	5½ 6½	6 7	6 7½	6 8	6½ 8	1
Ceiling betwixt Decks .....	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	4	1
Bilge Plank, inside, Thick Strakes over long and short Floorheads, and Limber Strake ..	2½	3	3½	3¾	4	4¼	4½	4¾	5	5½	1
Lower Deck Clamp where there is no shelf fitted, and Spirketting .....	—	—	3	3¼	3½	3¾	4	4	4¼	4½	1
Upper Deck Clamp where a Shelf is also fitted	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4	1
Planksheer .....	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4	1
Flat of Upper Deck (see note at side) .....	2½	2½	2½	3	3	3	3	3	3	3½	1
Scarphs of Keelson without Rider .....	ft. in. 4 6	ft. in. 4 9	ft. in. 5 0	ft. in. 5 3	ft. in. 5 6	ft. in. 5 10	ft. in. 6 2	ft. in. 6 6	ft. in. 6 9	ft. in. 7 0	ft. in. 7
Ditto, where Rider Keelson is added, also Scarphs of Keel .....	4 0	4 3	4 6	4 9	5 0	5 2	5 4	5 6	5 9	6 0	6
Main Piece of Windlass (see footnote) INCHES..	12	14	14	15	15	15	16	16	17	17	18

Mouldings of Futtocks and Top Timbers to diminish gradually from size given

- (a) Should the timber and space be increased, the siding of the timbers to be increased in proportion. See RULES, sec. 39.  
 (b) When the heels of 1st Foothooks meet at the middle line on the Keel, under the Keelson, either with full moulding, or with Cross Chocks proper butted, the siding of single Floors, and their moulding at the Keelson, may be REDUCED to the siding and moulding allowed for Double Floors.  
 (c) The rabbet of the Keel, Stem, and Sternpost to be made so as to leave sufficient substance of wood to form a substantial back rabbet.  
 (d) For breadth of Wales required in every case, see SECTION 45.  
 (e) All the fore and after hoods, both outside and inside, may be reduced one-sixth in thickness. Furrans are not allowed in this or in any other part of a ship.



	650	700	750	800	850	900	950	1050	1150	1250	1350	1500	1750	2000
30	31	31 $\frac{1}{4}$	31 $\frac{1}{2}$	31 $\frac{3}{4}$	32 $\frac{1}{4}$	32 $\frac{1}{2}$	32 $\frac{3}{4}$	33 $\frac{1}{4}$	33 $\frac{1}{2}$	33 $\frac{3}{4}$	34	34 $\frac{1}{2}$	35	
31	13 $\frac{1}{2}$	13 $\frac{1}{2}$	13 $\frac{3}{4}$	13 $\frac{3}{4}$	14	14	14 $\frac{1}{4}$	14 $\frac{1}{2}$	14 $\frac{3}{4}$	15	15 $\frac{1}{4}$	15 $\frac{1}{2}$	15 $\frac{3}{4}$	
32	12 $\frac{1}{2}$	12 $\frac{1}{2}$	12 $\frac{3}{4}$	12 $\frac{3}{4}$	13	13	13 $\frac{1}{4}$	13 $\frac{1}{2}$	13 $\frac{3}{4}$	14	14 $\frac{1}{4}$	14 $\frac{1}{2}$	14 $\frac{3}{4}$	
33	11 $\frac{3}{4}$	11 $\frac{3}{4}$	12	12 $\frac{1}{4}$	12 $\frac{1}{4}$	12 $\frac{1}{2}$	12 $\frac{3}{4}$	13 $\frac{1}{4}$	13 $\frac{1}{2}$	13 $\frac{3}{4}$	14 $\frac{1}{4}$	14 $\frac{1}{4}$	14 $\frac{1}{2}$	14 $\frac{3}{4}$
34	10 $\frac{3}{4}$	10 $\frac{3}{4}$	11	11 $\frac{1}{4}$	11 $\frac{1}{4}$	11 $\frac{1}{2}$	11 $\frac{3}{4}$	12 $\frac{1}{4}$	12 $\frac{1}{2}$	12 $\frac{3}{4}$	13 $\frac{1}{4}$	13 $\frac{1}{4}$	13 $\frac{1}{2}$	13 $\frac{3}{4}$
35	9 $\frac{3}{4}$	9 $\frac{3}{4}$	10	10 $\frac{1}{4}$	10 $\frac{1}{4}$	10 $\frac{1}{2}$	10 $\frac{3}{4}$	11 $\frac{1}{4}$	11 $\frac{1}{2}$	11 $\frac{3}{4}$	12 $\frac{1}{4}$	12 $\frac{1}{4}$	12 $\frac{1}{2}$	12 $\frac{3}{4}$
36	9 $\frac{1}{4}$	9 $\frac{1}{2}$	9 $\frac{1}{2}$	9 $\frac{1}{2}$	9 $\frac{3}{4}$	9 $\frac{3}{4}$	10	10	10 $\frac{1}{4}$	10 $\frac{1}{2}$	10 $\frac{3}{4}$	10 $\frac{3}{4}$	11	11 $\frac{1}{4}$
37	6 $\frac{1}{4}$	6 $\frac{1}{2}$	6 $\frac{3}{4}$	6 $\frac{3}{4}$	7	7	7 $\frac{1}{4}$	7 $\frac{1}{4}$	7 $\frac{1}{2}$	7 $\frac{3}{4}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{3}{4}$	9
38	13 $\frac{1}{2}$	13 $\frac{1}{2}$	13 $\frac{3}{4}$	13 $\frac{3}{4}$	14	14	14 $\frac{1}{4}$	14 $\frac{1}{2}$	14 $\frac{3}{4}$	15	15 $\frac{1}{4}$	15 $\frac{1}{4}$	15 $\frac{1}{2}$	16
39	14 $\frac{1}{2}$	14 $\frac{1}{2}$	14 $\frac{3}{4}$	14 $\frac{3}{4}$	15	15	15 $\frac{1}{4}$	15 $\frac{1}{2}$	15 $\frac{3}{4}$	16	16 $\frac{1}{4}$	16 $\frac{1}{2}$	16 $\frac{3}{4}$	17
40	15 $\frac{1}{2}$	15 $\frac{1}{2}$	15 $\frac{3}{4}$	15 $\frac{3}{4}$	16	16	16 $\frac{1}{4}$	16 $\frac{1}{2}$	16 $\frac{3}{4}$	17	17 $\frac{1}{4}$	17 $\frac{1}{2}$	17 $\frac{3}{4}$	18
41	5 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{3}{4}$	6	6	6	6 $\frac{1}{4}$	6 $\frac{1}{2}$	6 $\frac{3}{4}$	7
42	4	4	4	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	5
43	4	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	4 $\frac{3}{4}$	5	5 $\frac{1}{4}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$
44	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	4	4	4 $\frac{1}{4}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$
45	7	7	7	7	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	8	8	8 $\frac{1}{2}$	8 $\frac{1}{2}$	9
46	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	9	9	9	9	9	9 $\frac{1}{2}$	9 $\frac{1}{2}$	9 $\frac{1}{2}$	9 $\frac{1}{2}$	10
47	2 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	3	3	3	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$
48	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	4 $\frac{3}{4}$	5	5	5 $\frac{1}{4}$	5 $\frac{1}{2}$	5 $\frac{3}{4}$	6	6 $\frac{1}{4}$	6 $\frac{1}{4}$	6 $\frac{1}{2}$
49	4 $\frac{3}{4}$	4 $\frac{3}{4}$	4 $\frac{3}{4}$	4 $\frac{3}{4}$	4 $\frac{3}{4}$	5	5	5	5 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{3}{4}$
50	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	4	4	4 $\frac{1}{4}$	4 $\frac{1}{2}$	5
51	4	4	4	4	4	4	4	4	4	4	4	4 $\frac{1}{4}$	4 $\frac{1}{2}$	5
52	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	4	4	4	4	4	4	4	4	4
ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
7 0	7 0	7 0	7 3	7 3	7 3	7 3	7 6	7 6	7 9	7 9	8 0	8 0	8 0	8 0
6 0	6 0	6 0	6 3	6 3	6 3	6 3	6 6	6 6	6 9	6 9	7 0	7 0	7 0	7 0
18	19	19	20	21	21	22	22	23	23	24	24	25	25	27

Length of Beam amidships.	HOLD BEAMS		DECK BEAMS	
	sided and moulded.	moulded at ends.	sided and moulded.	moulded at ends.
Ft.	In.	In.	In.	In.
10	—	—	4 $\frac{1}{2}$	3 $\frac{3}{4}$
11	—	—	5	4
12	—	—	5 $\frac{1}{2}$	4 $\frac{1}{4}$
13	—	—	5 $\frac{3}{4}$	4 $\frac{1}{2}$
14	—	—	5 $\frac{3}{4}$	4 $\frac{3}{4}$
15	8	6 $\frac{3}{4}$	6 $\frac{1}{4}$	5 $\frac{1}{4}$
16	8 $\frac{1}{2}$	7	6 $\frac{1}{2}$	5 $\frac{1}{2}$
17	8 $\frac{3}{4}$	7 $\frac{1}{2}$	6 $\frac{3}{4}$	5 $\frac{1}{2}$
18	9 $\frac{1}{4}$	7 $\frac{3}{4}$	7	5 $\frac{3}{4}$
19	9 $\frac{1}{2}$	8	7 $\frac{1}{4}$	6
20	10	8 $\frac{1}{2}$	7 $\frac{1}{2}$	6 $\frac{1}{4}$
21	10 $\frac{1}{4}$	8 $\frac{3}{4}$	7 $\frac{3}{4}$	6 $\frac{1}{2}$
22	10 $\frac{1}{2}$	9	8	6 $\frac{1}{2}$
23	11	9 $\frac{1}{4}$	8 $\frac{1}{4}$	6 $\frac{3}{4}$
24	11 $\frac{1}{4}$	9 $\frac{1}{2}$	8 $\frac{1}{2}$	7
25	11 $\frac{3}{4}$	9 $\frac{3}{4}$	8 $\frac{1}{2}$	7 $\frac{1}{4}$
26	12	10	8 $\frac{3}{4}$	7 $\frac{1}{4}$
27	12 $\frac{1}{4}$	10 $\frac{1}{4}$	9	7 $\frac{1}{2}$
28	12 $\frac{1}{2}$	10 $\frac{1}{2}$	9	7 $\frac{1}{2}$
29	12 $\frac{3}{4}$	10 $\frac{3}{4}$	9 $\frac{1}{4}$	7 $\frac{3}{4}$
30	13	11	9 $\frac{1}{2}$	8
31	13 $\frac{1}{4}$	11 $\frac{1}{4}$	9 $\frac{1}{2}$	8
32	13 $\frac{1}{2}$	11 $\frac{1}{2}$	9 $\frac{3}{4}$	8 $\frac{1}{4}$
33	13 $\frac{3}{4}$	11 $\frac{3}{4}$	10	8 $\frac{1}{4}$
34	14	11 $\frac{3}{4}$	10	8 $\frac{1}{2}$
35	14 $\frac{1}{4}$	12	10 $\frac{1}{4}$	8 $\frac{1}{2}$
36	14 $\frac{1}{2}$	12 $\frac{1}{4}$	10 $\frac{1}{4}$	8 $\frac{1}{2}$
37	14 $\frac{3}{4}$	12 $\frac{1}{2}$	10 $\frac{1}{2}$	8 $\frac{3}{4}$
38	15	12 $\frac{1}{2}$	10 $\frac{1}{2}$	8 $\frac{3}{4}$
39	15 $\frac{1}{4}$	12 $\frac{3}{4}$	10 $\frac{1}{2}$	9
40	15 $\frac{1}{2}$	13	10 $\frac{3}{4}$	9

Floor Heads to that at Top Timber Heads. See RULES, sec. 38.

(f) This depth of Waterway for Faying Surface against Timbers is required, below the underside of the Planksheer, to receive in and out through Bolts at alternate Timbers, with alternate through bolts in Shelf, and in Clamp where there is no Shelf.

MEM.—For relaxations in respect to Poops, Top-gallant Forecasts, and raised quarter decks, see RULES, sec. 38. For requirements for Vessels of excessive lengths as compared with breadth and depth, see RULES, secs. 39, 45, and 62.

WINDLASS.—The diameter of main piece of windlasses in Steam Ships may be 7/8 of that required in the Table, provided always the body of the windlass be not of unusual length.

N.B.—The size of Orlop Beams to be the mean of the sizes here prescribed.

The siding and moulding of ALL the Beams to be the same as those amidships, except those at the AFTER END of the Ship, which may be reduced in proportion to their diminished length.

MEM.—When SPRUCE, WHITE CEDAR or YELLOW PINE is used for Beams, the dimensions are to be increased.—See RULES, sec. 40.



# SUGGESTED TABLE, B 2.

FOR THE THICKNESS OF INSIDE PLANK, &c., IN THE CONSTRUCTION OF SHIPS BUILT IN THE BRITISH NORTH AMERICAN COLONIES AND ALL FIR SHIPS WHEREVER BUILT.

TONNAGE - Tons	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1050	1150	1250	1350	1500	1750	2000
Thick Waterway. Inches . . . . .	5	5 $\frac{1}{4}$	5 $\frac{1}{2}$	6	6	6 $\frac{1}{2}$	7	7 $\frac{1}{2}$	7 $\frac{1}{2}$	8	8	8 $\frac{1}{2}$	8 $\frac{1}{2}$	9	9	9 $\frac{1}{2}$	9 $\frac{1}{2}$	10	10 $\frac{1}{2}$	11	11 $\frac{1}{2}$	12	12 $\frac{1}{2}$	13	13 $\frac{1}{2}$	14
Spirketting . . . . .	—	—	3	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	4	4	4 $\frac{1}{4}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	4 $\frac{3}{4}$	4 $\frac{3}{4}$	5	5	5 $\frac{1}{4}$	5 $\frac{1}{2}$	5 $\frac{3}{4}$	5 $\frac{3}{4}$	6	6 $\frac{1}{4}$	6 $\frac{1}{2}$	6 $\frac{3}{4}$	6 $\frac{3}{4}$	7
Ceiling Below Hold Beam Clamp and between Decks. . .	2	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	4	4	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	5	5	5 $\frac{1}{4}$	5 $\frac{1}{2}$	5 $\frac{3}{4}$	5 $\frac{3}{4}$	6	6
Bilge Plank (Inside) . .	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	3 $\frac{3}{4}$	4	4 $\frac{1}{4}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	5	5 $\frac{1}{2}$	6	6 $\frac{1}{2}$	7	7	7 $\frac{1}{2}$	8	8 $\frac{1}{2}$	9	9 $\frac{1}{2}$	10 $\frac{1}{2}$	11 $\frac{1}{2}$	12	12 $\frac{1}{2}$	13	13 $\frac{1}{2}$	14
Thickstuff over long and short Floor- heads and Limber Strakes . . . . .	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	4	4 $\frac{1}{4}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	5	5 $\frac{1}{4}$	5 $\frac{1}{2}$	5 $\frac{3}{4}$	6	6 $\frac{1}{4}$	6 $\frac{1}{2}$	6 $\frac{3}{4}$	7	7 $\frac{1}{4}$	7 $\frac{1}{2}$	7 $\frac{3}{4}$	8	8 $\frac{1}{4}$	8 $\frac{1}{2}$
Main Keelson (Rider Keelsons may be two-thirds that of main ditto.)	9	10	11	11 $\frac{3}{4}$	12 $\frac{1}{4}$	12 $\frac{3}{4}$	13 $\frac{3}{4}$	14	14 $\frac{1}{2}$	15	15 $\frac{1}{4}$	15 $\frac{1}{2}$	15 $\frac{1}{2}$	15 $\frac{1}{2}$	15 $\frac{3}{4}$	15 $\frac{3}{4}$	16	16	16 $\frac{1}{4}$	16 $\frac{1}{2}$	16 $\frac{3}{4}$	17	17 $\frac{1}{4}$	17 $\frac{1}{2}$	17 $\frac{3}{4}$	18



# WOOD VESSELS.

## TABLE D.

Sizes of BOLTS, PINNIES, OR RUDDER

SHIPS OF 100 TONS AND UNDER

1881

1882

TONNAGE	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623	2624	2625	2626	2627	2628	2629	2630	2631	2632	2633	2634	2635	2636	2637	2638	2639	2640	2641	2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670	2671	2672	2673	2674	2675	2676	2677	2678	2679	2680	2681	2682	2683	2684	2685	2686	2687	2688	2689	2690	2691	2692	2693	2694	2695	2696	2697	2698	2699	2700	2701	2702	2703	2704	2705	2706	2707	2708	2709	2710	2711	2712	2713	2714	2715	2716	2717	2718	2719	2720	2721	2722	2723	2724	2725	2726	2727	2728	2729	2730	2731	2732	2733	2734	2735	2736	2737	2738	2739	2740	2741	2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754	2755	2756	2757	2758	2759	2760	2761	2762	2763	2764	2765	2766	2767	2768	2769	2770	2771	2772	2773	2774	2775	2776	2777	2778	2779	2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791	2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2803	2804	2805	2806	2807	2808	2809	2810	2811	2812	2813	2814	2815	2816	2817	2818	2819	2820	2821	2822	2823	2824	2825	2826	2827	2828	2829	2830	2831	2832	2833	2834	2835	2836	2837	2838	2839	2840	2841	2842	2843	2844	2845	2846	2847	2848	2849	2850	2851	2852	2853	2854	2855	2856	2857	2858	2859	2860	2861	2862	2863	2864	2865	2866	2867	2868	2869	2870	2871	2872	2873	2874	2875	2876	2877	2878	28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# WOOD VESSELS.

## TABLE D.

Sizes of BOLTS, PINTLES OF RUDDER,

TONNAGE ( <i>see Section 32</i> ) .....	50	100
Heel-Knee, Stemson, and Deadwood Bolts .....	Inches $\frac{1\frac{1}{2}}{1\frac{1}{2}}$	$\frac{1\frac{1}{2}}{1\frac{1}{2}}$
Bolts in Sister Keelsons, Scarphs of Keel (☛), Arms of Breast Hooks, Pointers, Crutches, Riders, Hanging and Lodging Knees to Hold or Lower Deck Beams (except in and out Throat Bolts of Hanging Knees, which must be larger), also in and out Bolts of Shelf, Clamp, and Waterway of Hold or Lower Deck Beams, and the in and out Throat Bolts of Upper Deck Hanging Knees. }	$\frac{1\frac{1}{2}}{1\frac{1}{2}}$	$\frac{1\frac{1}{2}}{1\frac{1}{2}}$
Keelson Bolts (one through Keel at each Floor), Throats of Transoms, Throats of Breasthooks, and Throats of Hanging Knees to Hold or Lower Deck Beams .....	$\frac{1\frac{1}{2}}{1\frac{1}{2}}$	$\frac{1\frac{1}{2}}{1\frac{1}{2}}$
Bilge, Limber Strake, and Through Butt Bolts .....	$\frac{9}{16}$	$\frac{10}{16}$
Other Butt Bolts .....	$\frac{9}{16}$	$\frac{10}{16}$
Bolts through heels of cant timbers at fore and after Deadwood. In and out bolts of Upper Deck Waterway, Shelf and Clamp, also Arms of Hanging and Lodging Knees, except in and out Throat Bolts of Hanging Knees, which must be larger..... }	$\frac{10}{16}$	$\frac{11}{16}$
Pintles of Rudder { The Lower Brace must extend so as to receive not less than Two Bolts on the Planking on each side..... }	$1\frac{7}{8}$	2
Hardwood Treenails.....	1	1

### (☛) NUMBER OF BOLTS IN SCARPHS OF KEEL:—

Lloyd's Register of Shipping,  
25th May, 1871.

In Ships of 150 Tons and under.....	6 Bolts	} These Bolts to be of Copper or Yellow Metal in all cases.
" above 150 Tons and under 500 Tons ..	7 do.	
" 500 Tons and above.....	8 do.	



ND TREENAILS. *Section 46.*

TABLE E.  
NUMBER OF HANGING  
KNEES.  
*Section 41.*

	200	250	300	350	400	450	500	700	900	1350
1	1	$1\frac{1}{16}$	$1\frac{2}{16}$	$1\frac{2}{16}$	$1\frac{3}{16}$	$1\frac{4}{16}$	$1\frac{4}{16}$	$1\frac{5}{16}$	$1\frac{6}{16}$	$1\frac{8}{16}$
$1\frac{12}{16}$	$\frac{12}{16}$	$\frac{13}{16}$	$\frac{14}{16}$	$\frac{14}{16}$	$\frac{15}{16}$	$\frac{15}{16}$	1	$1\frac{2}{16}$	$1\frac{3}{16}$	$1\frac{4}{16}$
$1\frac{14}{16}$	$\frac{14}{16}$	$\frac{15}{16}$	1	1	$1\frac{1}{16}$	$1\frac{2}{16}$	$1\frac{2}{16}$	$1\frac{3}{16}$	$1\frac{4}{16}$	$1\frac{6}{16}$
$1\frac{10}{16}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{12}{16}$	$\frac{12}{16}$	$\frac{13}{16}$	$\frac{13}{16}$	$\frac{14}{16}$	$\frac{14}{16}$	$\frac{15}{16}$	1
$1\frac{10}{16}$	$\frac{10}{16}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{11}{16}$	$\frac{12}{16}$	$\frac{12}{16}$	$\frac{12}{16}$	$\frac{12}{16}$	$\frac{13}{16}$	$\frac{14}{16}$
$1\frac{11}{16}$	$\frac{11}{16}$	$\frac{12}{16}$	$\frac{13}{16}$	$\frac{13}{16}$	$\frac{14}{16}$	$\frac{14}{16}$	$\frac{14}{16}$	$\frac{15}{16}$	1	$1\frac{2}{16}$
2	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{3}{4}$	3	3	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{1}{2}$
1	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{1}{2}$

Tons.	To Hold Beams.	To Upper Deck Beams.
	PAIRS.	PAIRS.
150	—	4
200	4	6
250	5	7
300	6	8
350	7	9
400	8	10
450	8	11
500	9	12
550	9	13
600	10	14
650	10	15
700	11	16
750	11	17
800	12	18
900	13	20
1000	14	22
1100	15	24
1350	17	26

N.B.—Bolts to be through and clenched, as prescribed in *Section 46*, and to be of good quality, well made with suitable heads and be tightly driven.



NUMBER OF HANGING KNEES.

Size of BOLTS to be used.

Section 41.

To Upper Deck Beams	To Hold Beams	Tone	1350	1300	1250	1200	1150	1100	1050	1000	950	900	850	800	750	700	650	600	550	500	450	400	350	300	250	200	150	100	50	0	
4	—	150																													
6	4	200																													
7	5	250																													
8	6	300																													
9	7	350																													
10	8	400																													
11	8	450																													
12	9	500																													
13	9	550																													
14	10	600																													
15	10	650																													
16	11	700																													
17	11	750																													
18	12	800																													
20	13	900																													
22	14	1000																													
24	15	1100																													
26	17	1250																													

Bolts to be through and clinched as prescribed in Section 41 and to be of good quality.  
 Well made with suitable heads and be tightly driven.  
 1350 Tons and over 1 1/2 inch diameter  
 1100 Tons and over 1 1/4 inch diameter  
 900 Tons and over 1 1/4 inch diameter  
 700 Tons and over 1 1/4 inch diameter  
 500 Tons and over 1 1/4 inch diameter  
 300 Tons and over 1 1/4 inch diameter  
 150 Tons and over 1 1/4 inch diameter  
 100 Tons and over 1 1/4 inch diameter  
 50 Tons and over 1 1/4 inch diameter  
 25 Tons and over 1 1/4 inch diameter  
 10 Tons and over 1 1/4 inch diameter  
 5 Tons and over 1 1/4 inch diameter  
 2 1/2 Tons and over 1 1/4 inch diameter  
 1 1/2 Tons and over 1 1/4 inch diameter  
 1 Tons and over 1 1/4 inch diameter  
 500 Lbs and over 1 1/4 inch diameter  
 250 Lbs and over 1 1/4 inch diameter  
 100 Lbs and over 1 1/4 inch diameter  
 50 Lbs and over 1 1/4 inch diameter  
 25 Lbs and over 1 1/4 inch diameter  
 10 Lbs and over 1 1/4 inch diameter  
 5 Lbs and over 1 1/4 inch diameter  
 2 1/2 Lbs and over 1 1/4 inch diameter  
 1 1/2 Lbs and over 1 1/4 inch diameter  
 1 Lbs and over 1 1/4 inch diameter  
 500 Lbs and over 1 1/4 inch diameter  
 250 Lbs and over 1 1/4 inch diameter  
 100 Lbs and over 1 1/4 inch diameter  
 50 Lbs and over 1 1/4 inch diameter  
 25 Lbs and over 1 1/4 inch diameter  
 10 Lbs and over 1 1/4 inch diameter  
 5 Lbs and over 1 1/4 inch diameter  
 2 1/2 Lbs and over 1 1/4 inch diameter  
 1 1/2 Lbs and over 1 1/4 inch diameter  
 1 Lbs and over 1 1/4 inch diameter







# WOOD VESSELS.

## Minimum Dimensions of IRON KNEE AND KNEE RIDERS FOR

TONNAGE ( <i>see Section 32</i> ) .....Tons	150	200	250	300	350	400	450	500	550	600	650
Number of Hanging Knees to Hold or Lower Deck Beams .....Pairs } (a)	3	4	6	8	9	Upwards,	one Knee Rider to				
Number of Hanging Knees to Upper and Middle Deck Beams .....Pairs }	4	6	7	8	9	10	11	12	13	14	15
Breadth of Knees and Riders to Hold or Lower Deck Beams .....Inches }	3	3	3	3	3	3	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	
Breadth of Upper Deck Knees, where there are two Decks, and of Middle Deck Knees, where there are three Decks .....Inches }	3	3	3	3	3	3	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	
Thickness of Riders at the joints or butts of the Timbers .....Inches }	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	2	2	
Thickness of Knees to Lower Deck or Hold Beams and Knee Riders at the Angle of the Throat .....Inches }	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	3	3	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	
Thickness of Knees to Lower Deck or Hold Beams and Knee Riders at the Throat Bolts .....Inches }	1 $\frac{3}{4}$	1 $\frac{3}{4}$	2	2	2 $\frac{1}{4}$	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	
Thickness of Knees to Upper or Middle Deck at the Throat Bolts .....Inches } (b)	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	2	2	2 $\frac{1}{4}$	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	
Thickness of Hanging Knees (not Riders) at the ends .....Inches }	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	
Length of Beam Arms of Knees and Knee Riders for Lower Deck or Hold Beams... } (c)	ft. in. 26	ft. in. 26	ft. in. 29	ft. in. 29	ft. in. 30	ft. in. 30	ft. in. 33	ft. in. 33	ft. in. 33	ft. in. 36	ft. in. 36

NOTE.—The Bolts in all Iron Riders in Hold, to be not more than twenty-one inches apart on the average. Standards upon the Beams of such Ships are not admitted as substitutes for Hanging Knees below them. For sizes of Bolts, see Table D.

(a) Provided the depth of hold be 13ft. or upwards.

*Lloyd's Register of Shipping,*  
7th March, 1878.



TABLE F.

BRITISH NORTH AMERICAN BUILT SHIPS AND FIR SHIPS. Section 62.

700	750	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
Beam, or Knees and			Riders	as per		Section 62.								
16	17	18	Upwards, one to every Beam											
3 $\frac{3}{4}$	4	4	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	4 $\frac{3}{4}$	5	5	5 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$
3 $\frac{1}{2}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	4	4	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	4 $\frac{3}{4}$	4 $\frac{3}{4}$	4 $\frac{3}{4}$
2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	3	3	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$
3 $\frac{3}{4}$	4	4	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	4 $\frac{3}{4}$	5	5	5 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$
2 $\frac{3}{4}$	3	3	3	3	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$
2 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	3	3	3	3	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ft. 3 in. 6	ft. 3 in. 9	ft. 3 in. 9	ft. 3 in. 9	ft. 3 in. 9	ft. 4 in. 0	ft. 4 in. 0	ft. 4 in. 0	ft. 4 in. 0	ft. 4 in. 0	ft. 4 in. 0	ft. 4 in. 0	ft. 4 in. 0	ft. 4 in. 0	ft. 4 in. 0

(b) Breadth and thickness of Knees for Upper Deck, where there are Three Decks, may be one sixth less.

(c) Beam Arms of Upper and Middle Deck Knees, may be three inches shorter than those of the Lower Deck.

Side Arms of Hanging Knees not to be less in length, than one and a half the length of their Beam Arms. "Jumped Knees" will not be allowed.

Beam Arms of Knees and Knee Riders, which are 3ft. 6in. in length, to have not less than Four Bolts; and shorter than that length, to have not less than Three Bolts.

Side Arms of all Hanging Knees to have at least One Bolt more than in the Beam Arms.

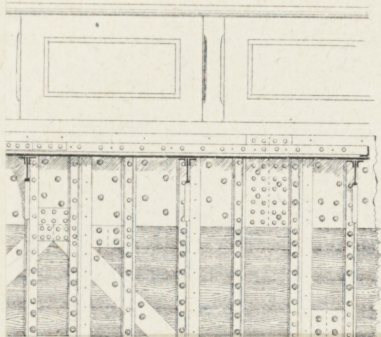




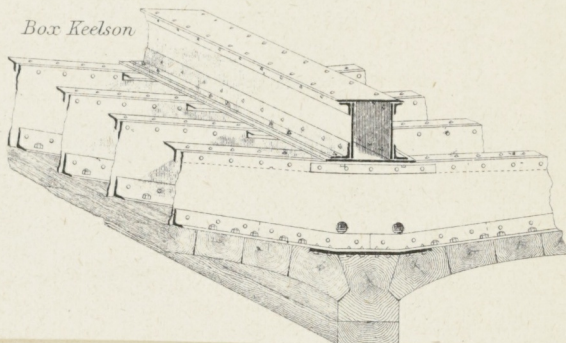


# SHIPPING.

## OF COMPOSITE SHIPS

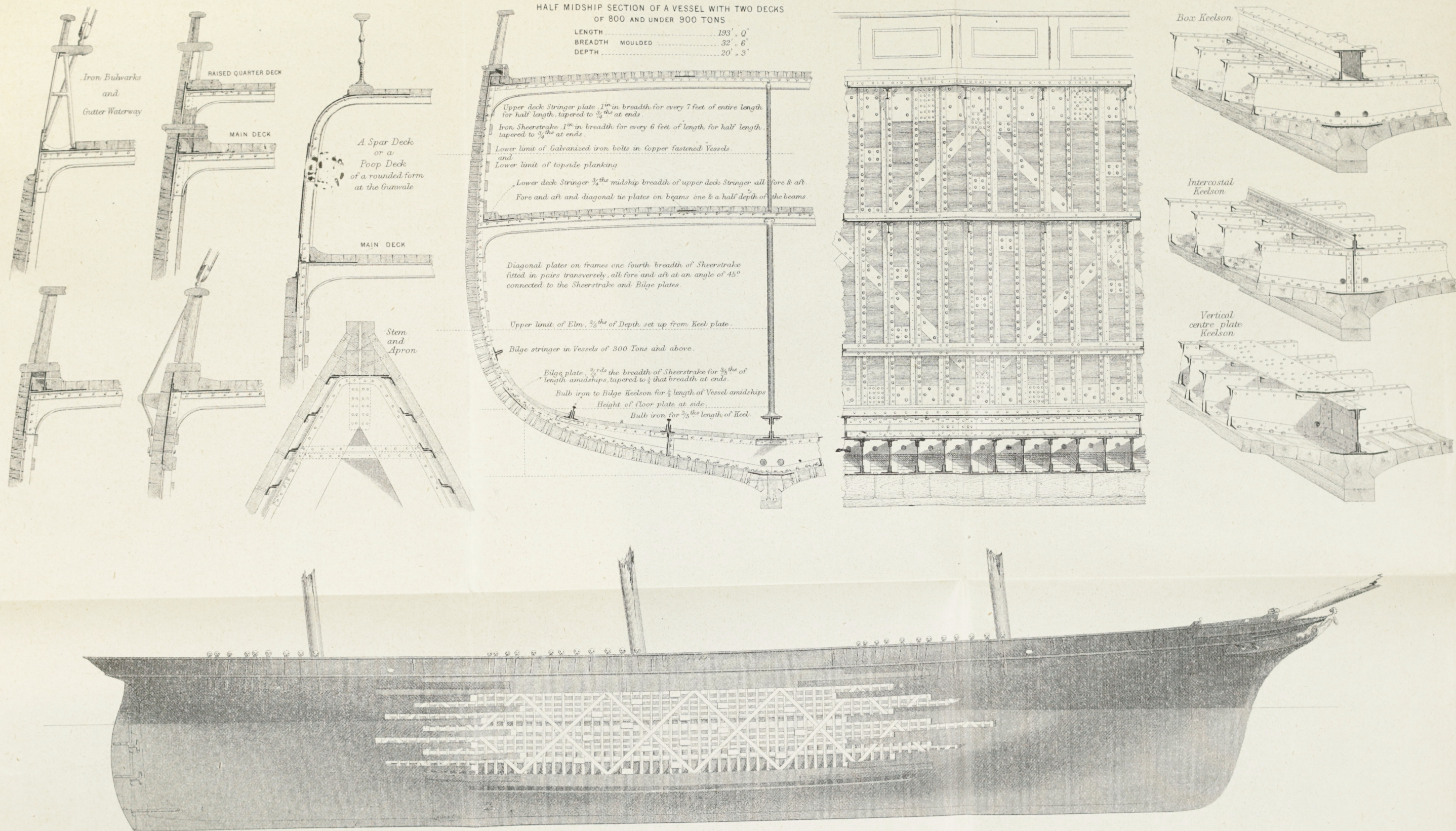


*Box Keelson*





LLOYD'S REGISTER OF BRITISH AND FOREIGN SHIPPING.  
 ILLUSTRATIONS OF THE SUGGESTIONS FOR THE CONSTRUCTION AND CLASSIFICATION OF COMPOSITE SHIPS  
 1868.





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# COMPOSITE VESSELS.

## Table of Minimum Dimensions of Frames, Planking, Keels, &c.

All plates, and all beam and angle iron, used in ships intended for classification, are to be stamped by

Tonnage. <i>See Notes to Table.</i>	Distance of Frames from Moulding Edge to Moulding Edge all Fore and Aft.	Siding of Keel, Stem and Stern Post and Moulding of Stem.	Moulding of Stern Post and Keel.	Breadth and Thickness of Keel Plate, Flat Plate Keelson, and Thickness of Single Plate Vertical Keelson, standing upon Floors		Dimensions of Angle Iron for Frames, and the Lower Angle Irons of Box Keelsons.	Dimensions of Angle Iron for Reverse Frames, and the Top Angle Irons of Box Keelsons.	Thickness of Centre Plate Keelson, Sheerstrake, (where not planked over), also of Butt Plates for Planking in Midships.	Thickness of Floor Plates, Hooks, Crutches, Side Inter-costal and Box Keelson.	Thickness of Stringer Plates upon Beam Ends, Tie Plates on Beams, Sheerstrake (where planked over) and Topside Plating (where not planked over), Bilge Strake and Diagonal Plates on Frames and Middle Line Inter-costal Keelsons.
				Breadth	Thickness					
Tons. 50 and under 100	18	9 $\frac{1}{2}$	11	19	$\frac{8}{16}$	$2\frac{3}{4} \times 2\frac{3}{4} \times \frac{5}{16}$	$2\frac{1}{4} \times 2\frac{1}{4} \times \frac{4}{16}$	$\frac{6}{16}$	$\frac{5}{16}$	$\frac{5}{16}$
100 and under 200	18	10 $\frac{1}{2}$	12	21	$\frac{9}{16}$	$2\frac{3}{4} \times 2\frac{3}{4} \times \frac{6}{16}$	$2\frac{1}{4} \times 2\frac{1}{4} \times \frac{5}{16}$	$\frac{7}{16}$	$\frac{5}{16}$	$\frac{6}{16}$
200 and under 300	18	11 $\frac{1}{2}$	13	23	$\frac{10}{16}$	$3 \times 3 \times \frac{6}{16}$	$2\frac{1}{4} \times 2\frac{1}{4} \times \frac{5}{16}$	$\frac{8}{16}$	$\frac{6}{16}$	$\frac{7}{16}$
300 and under 400	18	12 $\frac{1}{2}$	14	25	$\frac{10}{16}$	$3 \times 3 \times \frac{6}{16}$	$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{5}{16}$	$\frac{9}{16}$	$\frac{7}{16}$	$\frac{8}{16}$
400 and under 500	18	13	14 $\frac{1}{2}$	26	$\frac{11}{16}$	$3\frac{1}{4} \times 3\frac{1}{2} \times \frac{7}{16}$	$2\frac{1}{2} \times 2\frac{3}{4} \times \frac{6}{16}$	$\frac{9}{16}$	$\frac{7}{16}$	$\frac{8}{16}$
500 and under 600	18	13 $\frac{1}{2}$	15	27	$\frac{11}{16}$	$3\frac{1}{4} \times 3\frac{1}{2} \times \frac{7}{16}$	$2\frac{1}{2} \times 3 \times \frac{6}{16}$	$\frac{10}{16}$	$\frac{8}{16}$	$\frac{9}{16}$
600 and under 700	18	14	15 $\frac{1}{2}$	28	$\frac{12}{16}$	$3\frac{1}{2} \times 4 \times \frac{8}{16}$	$2\frac{3}{4} \times 3 \times \frac{6}{16}$	$\frac{10}{16}$	$\frac{8}{16}$	$\frac{9}{16}$
700 and under 800	18	14 $\frac{1}{2}$	16	29	$\frac{12}{16}$	$3\frac{1}{2} \times 4 \times \frac{8}{16}$	$3 \times 3 \times \frac{6}{16}$	$\frac{11}{16}$	$\frac{9}{16}$	$\frac{10}{16}$
800 and under 900	18	15	16 $\frac{1}{2}$	30	$\frac{13}{16}$	$3\frac{3}{4} \times 4\frac{1}{2} \times \frac{9}{16}$	$3 \times 3 \times \frac{7}{16}$	$\frac{11}{16}$	$\frac{9}{16}$	$\frac{10}{16}$
900 and under 1000	18	15 $\frac{1}{2}$	17	31	$\frac{13}{16}$	$3\frac{3}{4} \times 4\frac{1}{2} \times \frac{9}{16}$	$3 \times 3\frac{1}{4} \times \frac{7}{16}$	$\frac{12}{16}$	$\frac{10}{16}$	$\frac{11}{16}$
1000 and under 1200	18	16	17 $\frac{1}{2}$	32	$\frac{14}{16}$	$3\frac{3}{4} \times 4\frac{3}{4} \times \frac{9}{16}$	$3 \times 3\frac{1}{2} \times \frac{8}{16}$	$\frac{12}{16}$	$\frac{10}{16}$	$\frac{11}{16}$
1200 and under 1500	18	16 $\frac{1}{2}$	18	33	$\frac{14}{16}$	$3\frac{3}{4} \times 4\frac{3}{4} \times \frac{9}{16}$	$3\frac{1}{2} \times 3\frac{1}{2} \times \frac{8}{16}$	$\frac{13}{16}$	$\frac{11}{16}$	$\frac{12}{16}$
1500 and under 2000	18	17	18 $\frac{1}{2}$	34	$\frac{15}{16}$	$4 \times 5 \times \frac{10}{16}$	$3\frac{1}{2} \times 4 \times \frac{9}{16}$	$\frac{13}{16}$	$\frac{11}{16}$	$\frac{12}{16}$
2000 and under 2500	18	17 $\frac{1}{4}$	19	34 $\frac{1}{2}$	$\frac{15}{16}$	$4 \times 5\frac{1}{2} \times \frac{10}{16}$	$3\frac{1}{2} \times 4\frac{1}{2} \times \frac{10}{16}$	$\frac{14}{16}$	$\frac{12}{16}$	$\frac{13}{16}$
2500 and under 3000	18	17 $\frac{1}{4}$	19 $\frac{1}{4}$	34 $\frac{1}{2}$	$\frac{15}{16}$	$4 \times 6 \times \frac{11}{16}$	$3\frac{1}{2} \times 4\frac{1}{2} \times \frac{10}{16}$	$\frac{14}{16}$	$\frac{12}{16}$	$\frac{13}{16}$
3000 and under 3500	18	17 $\frac{1}{2}$	19 $\frac{1}{2}$	35	$\frac{16}{16}$	$4 \times 6\frac{1}{2} \times \frac{11}{16}$	$3\frac{1}{2} \times 4\frac{1}{2} \times \frac{10}{16}$	$\frac{15}{16}$	$\frac{12}{16}$	$\frac{13}{16}$

MEM.—The scantlings given in the above Table are intended for Ships the length of which, measured from the fore part of the Stem to the after part of the Stern-post on the range of the Upper Deck, does not exceed seven times their moulded breadth or ten times their depth of Hold, taken from the upper part of Floors to the top of the Upper Deck Beams.

RIVETS. Diameter of Rivets required for Thickness of Plates - - -	$\frac{5}{8}$ of an Inch.		$\frac{3}{4}$ of an Inch.		
	$\frac{5}{16}$	$\frac{6}{16}$	$\frac{7}{16}$	$\frac{8}{16}$	$\frac{9}{16}$



ly in two places with the manufacturer's trade mark, or his name and the place where made.

*Ships which exceed these proportions, the plans to be submitted for the Committee's consideration. The depth for defining proportions of spar decked vessels, is to be measured from the top of the floor plates to the upper side of the middle or large deck beams.*

\* For Notes relating to Table H see back.



## NOTES TO TABLE H.

**TONNAGE.**—In flush-decked vessels having either one, two, or three decks (not being spar or awning-decked), the tonnage under the upper deck, *without abatement of the tonnage of the space for the crew, or for the propelling power of steam vessels, is to regulate all the scantlings of the hull, and also the equipment of the vessel.* In vessels having a *raised quarter deck*, or a poop, or top-gallant forecastle, or deck houses, or awning deck, or spar deck, the total tonnage below the tonnage deck is to regulate the scantlings of the hull, but the register tonnage, as cut on the main beam of sailing vessels and of steam vessels, *with the addition of the tonnage of the space required for propelling power, is to regulate the equipment, and also the size of the main piece of rudder and windlass, and the keel and keelsons and their number, and the scantling of the stringer plates on the upper and lower deck beams, and the requirements as to double riveting.* But in vessels where the tonnage of the erections above the tonnage deck is less than that required for crew space, *then the difference between the tonnage of these erections and the tonnage of the space allowed for crew is to be added to the register tonnage, cut on the main beam, for the tonnage that is to regulate the equipment and the size of the main piece of rudder and windlass, and the keel and keelsons and their number, the scantling of the stringer plates on the upper and lower deck beams, and the requirements for double riveting.*

**WOOD KEEL, Stem, and Stern Post** to be of the dimensions specified in Table.

**KEEL PLATE.**—The keel plate to be of the breadth and thickness prescribed in Table H, to be made continuous up the apron and up the inner stern-post as high as practicable, but in all cases to extend above the lower deck or hold beam stringer angle iron. Forward and aft the plate is to be curved to the form of the bearding line, and to be one-sixteenth of an inch thicker than prescribed in the Table, where it passes over the deadwoods, apron, and inner stern-post, and to be sided as required by the form of the vessel, to have an angle iron of the size given in Table for stringer angle irons riveted on each edge, flanged to the form of the vessel to receive the plank fastenings. The keel plate to maintain its breadth for three-fifths the length of the keel amidships, and then to be gradually reduced until its edges conform with the flange of the angle iron on the keel plate forward and aft; the butts of the keel plates to be shifted clear of the keel scarphs.

**FRAMES.**—The frames to be of the dimensions as set forth in Table, and the narrow flange to be of a parallel thickness, that the nuts of the screw bolts may fit closely. The frames to be in as long lengths as possible, fitted and riveted on to the keel plate, and extended as near to the middle line as practicable, according to the plan of construction adopted, and in all cases to extend to the gunwale, and where raised quarter decks, poops, forecastles and spar decks are constructed, to their deck stringers respectively, except when constructed with a rounded form at the gunwale, then they may terminate at the lower part of the curve; if the frames be welded, the welds to be perfect with not less than four feet shifts from the welds of next frames, or if butted to have not less than four feet shifts with four feet lengths of angle iron of the same size as the frame, fitted back to back riveted to them, and secured to the outside planking. The spacing of the frames (where one thickness of planking in the bottom is intended) not to exceed 18 inches from moulding edge to moulding edge all fore and aft, a four feet length of angle iron, the size of the frame, is to be riveted to each floor and to the keel plate, back to back with the frames.

**FLOOR PLATES.**—The floor plates to be in thickness according to Table, but at each end of the vessel for one quarter of her length they may be reduced in thickness one-sixteenth of an inch where the midship floor plates are six-sixteenths and under ten-sixteenths of an inch, and two-sixteenths of an inch where the plates are ten-sixteenths and above in thickness. The floor plates to be in depth at middle line according to the following rule, viz., to the vessel's depth, measured from the top of the keel to the top of the upper or spar-decked beams amidships add the extreme breadth of the vessel, two-fifths of that sum in inches to be the depth of the floor plates at the middle line well fore and aft, but at the extreme fore and after ends, they must be deeper, so as to form an efficient connection between the two sides of the vessel. The floor plates are to extend up the bilges not less than to a perpendicular height of *twice* and a *half* the depth of floor amidships, from upper side of keel at middle line; and in no case to be less moulded in any part, than a fair taper between the depth at middle line, and the moulding at their extreme ends, which is to be not less than the moulding of the frames. The ends of the floors to maintain the height prescribed amidships, for one quarter of the vessel's length, they may then be gradually lowered forward and aft until the upper edges of the floor plates are level, which place is to be determined by the form of the vessel, and from that point to the vessel's ends they are to be gradually increased in depth, so as to efficiently connect the sides of the vessel; the upper parts of the floors forward and aft are to be high enough to give ample room between the reverse frames on each side of the vessel, for fitting the keelson angle irons. In vessels having considerable rise of floor, the depth of the floor plates, on a square, at the quarter of the vessel's extreme moulded breadth, set out from the middle line, is to be not less than three-fifths the depth of the floor plate, at the middle line, and the floor plate is to be extended up the bilges, by a fair taper from middle line, until it terminates at the moulding of the frames. A floor plate to be fitted and riveted to every frame, and to be extended across the middle line; but where a vertical centre plate is adopted at middle line, then the floor plates are to be efficiently connected to it on each side by double vertical angle irons of not less size than the reversed frames. When floors extend from side to side and are made in two lengths, the butts are to have double butt straps, one on each side of the floor plates, and three-fourths the thickness of the floor plates, or else the floor plates must be lapped and treble riveted.

**WATERCOURSES.**—Watercourses are to be formed through all the floor plates, on each side of the middle line and at the bilges above the frames, so as to allow water to reach the pumps freely, and also through the vertical centre plate, and intercostal keelsons when such keelsons are adopted.

**REVERSED FRAMES.**—Reversed angle irons on frames to be in size as per Table. All vessels under 200 tons to have reversed angle-iron riveted to every frame and floor plate, across the middle line, extended to the height of the upper part of the bilge, and to the gunwale on alternate frames, and to have double reversed angle irons in way of all keelsons and stringers in hold; and in addition, all vessels of 200 tons and upwards, to have reversed angle-iron extended to the upper deck beam stringer on alternate frames, and where raised quarter decks and spar-decks are constructed, to their deck stringers respectively, except when constructed of a rounded form at the gunwale, then they may terminate at the lower part of the curve; and on the remaining frames reversed angle-irons are to be fitted to above the height of the lower deck or hold beam stringer angle-iron, if the vessel has two decks or tiers of beams, and to above the height of the middle deck beam stringer angle-iron, if the vessel has three decks or tiers of beams, the rivets for securing the reversed angle-iron to the frames and floor plates to be in diameter as specified in Table, and be spaced not to exceed a distance of nine times their own diameter from centre to centre; butts of reversed angle-iron to be secured with butt straps.



NOTES TO TABLE H.—continued.

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BEAMS.—Beams to be of bulb plate, with double angle-irons on the top edge, or of T bulb iron, or of any other approved form of equal strength. The upper deck beams to be one quarter of an inch in depth to every foot in length of the midship beam, and to be in thickness one-sixteenth of an inch for every inch in depth, with one-sixteenth of an inch added; if of T bulb the united breadth of the top flanges to be not less than three-fourths the depth of the beam, and where beams are formed of bulb plate with double angle-irons on the top edge, the flanges of each of the angle-irons are not to be less in their united breadth than three-fourths the depth of the beam, and to be one-sixteenth of an inch in thickness for every inch of the two sides of the angle-iron. Middle deck, hold, and orlop beams, to be one-eighth of the depth deeper, and one-sixteenth of an inch thicker than the upper deck beams. All beams to be efficiently connected with the frames by bracket ends, or knee plates, the arms of each to be not less than twice-and-a-half the depth of the beams in length, and of not less thickness than the beams. All beams for at least three-quarters the length of the vessel in midships, and in addition the beams under the bowsprit, pall bit, windlass and capstan are to be pillared; the pillars to have not less than two rivets in each of their ends, so as to form a continuous tie from the keelson to the upper deck, or spar-deck, and to be of the sizes given in Table.

ON SHEERSTRAKE.—The iron sheerstrake to be one inch in breadth for every six feet of the vessel's length, for half her length in midships, and to be of the thickness given in Table; it may then be gradually reduced in breadth and in thickness to three-fourths of the midship breadth and thickness at her ends. The butts of the iron sheerstrake in all cases to be shifted clear of the butts of the stringer plates on the beam ends, the shift in no case to be less than equal to three spaces of frames, and all plates where practicable to be not less than nine feet long, but if the sheerstrake plates are eighteen feet long they may be of two equal breadths, but carvel plated and single riveted; butts of all plating to be fitted quite close, and in no case is the lower edge of the iron sheerstrake to be fitted less than two-thirds of the breadth required by the Rule for sheerstrake below the upper deck stringer plate. The butt straps in all cases to be in one piece, whether fitted outside or inside, and in no case to be in two pieces by being cut at the stringer plate. See Section 30.

ON BILGE STRAKE.—The bilge strake plates to be two-thirds the breadth of the iron sheerstrake, for three-fifths the length of the keel in midships, and from thence to the ends of the vessel they are to be reduced gradually to one-half their midship breadth; the thickness of the plates to be as prescribed in Table H, and they are to be fitted at the bilges with the middle of the plate at the height prescribed for floorheads, such position for the bilge plates to be maintained, notwithstanding that the floorheads may be carried higher. They are to be extended to the ends of the vessel in accordance with her form, and properly riveted to the frame.

DIAGONAL PLATES ON FRAMES.—The diagonal plates on the frames to be not less than one-third the breadth of the iron sheerstrake, and fitted in pairs, transversely, all fore and aft, at an angle of 45°, with the butts of each pair meeting between the frames; to be of the thickness given in Table, and connected to the sheer and bilge strake plates by butt straps double riveted, and to be efficiently riveted to each other, and to each frame they cross.

STRINGER PLATES.—All vessels to have stringer plates of the thickness given in Table upon the ends of each tier of beams. Those upon the ends of the upper deck beams of one, two, and three decked vessels to be in width one inch for every seven feet of the vessel's entire length for half her length in midships, and from thence to the ends of the vessel they may be gradually reduced to three-fourths the width in midships; in no case however is the width in midships to be less than eighteen inches. The stringer plates are to be riveted to the beams and properly shifted, fitted home, and riveted to the iron sheerstrake, with an angle iron of the dimensions given in Table, and the roughtree stanchions are not to pass through them. Stringer plates on the ends of beams below the upper deck may be reduced in width to three-fourths the midship breadth of the upper deck stringer, which breadth is to extend all fore and aft, and to have an angle iron of the dimensions given in Table, extending all fore and aft, riveted to reverse angle iron on each frame and to the stringer plates. In cases where a deck is not laid, and the width of the stringer plate on ends of hold beams is objected to, it may be reduced in width, provided such reduction be fully compensated for. All stringer angle irons are to be in as long lengths as possible, properly shifted, and wherever butted to be connected with angle iron or plate iron not less than two feet long, fitted in the throat of them, properly riveted to each flange, and the thickness of the connecting plates not to be less than the angle iron they cover. Upper deck gutter waterways are to be flooded to ascertain if there be any leakage, and when completed they are to be properly cemented.

PLATES.—All vessels are to have tie plates ranging all fore and aft upon each side of the hatchways on each tier of beams, and in addition thereto the beams of the upper and middle decks in three decked or spar decked vessels, and of the upper deck in vessels of one or two decks must have tie plates fitted from side to side diagonally, in number one pair for about every 35 feet of the vessel's length; these plates in both cases must not be less in width than once and a half the depth of the beams of their respective decks, and of the thickness required for stringer plates; they are to be well riveted to each other and to the beams and stringers, and to have intermediate fastenings into the deck plank between the beams, in all cases their butts to be chain riveted. Upon hold beams where a deck is not to be laid, a tie formed of double angle irons of the size given for the main frames of the ship may be fitted each side of the hatchways in lieu of tie plates, but if the beams are made of such additional strength laterally as not to require the support given by the said angle irons or tie plates, double angle irons of the above size fitted at the centre line, from opening to opening, may be substituted. All hatchways and mast holes are to be properly framed to receive half beams where required, and the latter to have mast partners at each tier of beams (except at orlop beams), the plating of which is not to be less in thickness than is required for stringer plates, and the united breadths of the plates are not to be less than three times the diameter of the masts; these plates to be well riveted to each other, and to the beams, and angle iron carlings, and at the decks where the masts are to be wedged, an angle iron of the dimensions required for the main frame of the ship is to be properly fitted and riveted to the plate round the mast hole. The mast holes, skylights, and companions must be properly secured to the satisfaction of the Surveyors. Where wood coamings are fitted, plates are to be riveted to the beams to which the deck ends are to be fastened.

STRAPS.—Butt straps in all cases, except those of floor plates (see Section 13) to be one-sixteenth of an inch thicker than the plates they connect, and to be fitted with the fibre of the iron in the same direction as that of the plates, and riveted as per Section 4.



## NOTES TO TABLE H.—*continued.*

**BUTT PLATES OF OUTSIDE PLANKING.**—The plates to which the butts of the outside planking are to be secured, must be of the breadth of the planks, and extend from frame to frame, efficiently riveted thereto, and of the thickness given in Table, but on the bows and quarters or wherever else the plank ends may have a tendency to strain off, they are to be one-eighth of an inch thicker than therein prescribed.

**RIVETS AND RIVETING.**—The rivets to be of the best quality, and to be of the diameter as per Table, the rivet holes to be regularly and equally spaced, and carefully punched opposite each other in the adjoining parts, from the faying surfaces in the laps, lining pieces, butt straps, and frames, and to be countersunk where required, the rivets not to be nearer to the butts or edges of the plating, lining pieces to butts, or of any angle iron, than a space equal to their own diameter, and not to be further apart from centre to centre than five times their diameter, or nearer than four times their diameter from centre to centre, and to be spaced through the frames and outside plating, and in reversed angle iron a distance equal to nine times their diameter from centre to centre. All butts of iron plating, excepting those of poops and top-gallant forecastles, to be at least double riveted, and a space equal to twice the diameter of the rivets to be between each row; where treble riveting is adopted, a space equal to twice the diameter of the rivet to be between each row, with half the number of rivets in the back row.

**GARBOARD STRAKES.**—The garboard strakes not to be less than two-thirds the depth of the keel prescribed in Table, and properly rabbeted into it, to be fitted closely to the iron keel plate, and to be of sufficient width. The butts of the garboard strakes to have not less than four feet six inches shift from the butts of the garboard strake on the opposite side of the vessel, nor less than the same shift clear of the keel scarp. For bolting, *see* Section 33.

**PLANKING.**—The planking to be thoroughly seasoned, quite free from sap, wane, or other defects, to be wrought with the heart side to the frames, and with not less than three strakes between the butts, without step butting, and with not less than six feet shifts; the garboard strakes to be shifted and of the thickness given in Section 7; the bottom planking is not to be less in thickness than prescribed in Table, from the garboard strakes up to within a fifth of the depth of hold set down below the upper deck stringer plate, from thence to the planksheer to be in thickness as prescribed in Table for topsides; or, if preferred, the bottom planking may retain its thickness up to within a fourth of the depth of the hold set down below the upper deck stringer plate, and from thence to the planksheer be gradually diminished in thickness to that prescribed in Table for topsides; the thickness of the wood sheerstrakes may be the thickness of the iron sheerstrake they cover less than that prescribed by Table. Outside planks (except the garboard strakes) are not to be more than twelve inches broad; they are to be fitted quite close to the frames and plates, and to each other at their inner edges, and wrought with proper seams outside in proportion to their thickness; the hood-ends may be reduced one-fifth from the thickness given in Table, at the stem or stern-post, and one-third at the buttock. The caulking edge of the keel seam, and hood-end seams of the planking at the stem and stern-post, need not exceed from two and a half inches to four inches, in proportion to the tonnage of the vessel; which can be arranged by trimming the back rabbit from the bearding line as required, so as not to unnecessarily reduce the keel, stem, and stern-post. Funnels or pads are in no case to be used.

**DECKS.**—The flat of all decks to be of good quality, properly seasoned, free from sap and objectionable knots, the thickness and fastenings as per Table. The upper deck plank to be fastened by screw bolts from the upper side with nuts at the under side of the angle irons of the beams and to the tie plates, *see* Section 29. The bolts must be properly sunk, with oakum and white lead under their heads, and be carefully covered over with turned dowels, their fibre in the same direction as the deck plank, and bedded in white lead, marine glue, or other suitable composition. When the deck planks are six inches in width and under, single fastening will be sufficient; but when they are above six inches and not exceeding eight inches in width, there must be two bolts in each plank in every beam, one of which may be a short screw bolt; and planks exceeding eight inches in width must be double fastened with nut and screw bolts. If the deck is of Teak it may be one-eighth less in thickness than prescribed in the Table. Upper decks must be renewed when worn in thickness as follows, viz.:—When a deck originally 4 inches thick is worn to 3 inches;  $3\frac{1}{2}$  inches to  $2\frac{3}{4}$  inches; 3 inches to  $2\frac{1}{2}$  inches.

**CEMENT.**—All vessels to be efficiently cemented in the bottom to the upper part of the bilges, care to be taken to have proper water courses above the cement all fore and aft.

**WINDLASS.**—The diameter of main piece of windlasses in Steam Ships may be seven-eighths of that required in the Table, provided always the body of the windlass be not of unusual length.



# COMPOSITE VESSELS.

## TABLE I.

Exhibiting the Number of Years to be assigned to the different descriptions of Timber used in Composite Vessels.

*The same to be of good quality, properly seasoned, and free from defect.*

	TIMBER.	KEEL.	Stem, Sternpost, Apron, Inner Sternpost, Deadwood, Knightheads and Hawse Timbers.	Floors, Wood Frames and Ceilings upon them; Beams and Keelsons.	OUTSIDE PLANK.		Upper Deck Waterway, Spirketting Planksheer, and Roughtree Timbers.	RUDDER, WINDLASS, and PALL BITT. — Main Pieces.
					From Top of Keel to Two-fifths the Depth of Hold (a)	From Two-fifths the Depth of Hold (a) to Gunwale.		
1	East India Teak .....	16	16	16	16	16	16	16
2	Greenheart, Morra, Iron Bark .....	14	12	12	14	12	12	14
3	(b) Live Oak, English, African, French, Adriatic, Italian, Spanish, and Portuguese Oaks .....	14	12	12	12	12	12	14
4	Pitch Pine, Oregon and Huon Pine, Larch, Hackmatack, Cowdie or Kaurie Pine ..	9	9	9	12	10	10	—
5	(b) Northern Continental Oak	12	9	9	12	10	10	9
6	(b) American White Oak ....	10	7	7	10	8	7	7
7	Dantzic, Memel, Riga, and American Red Pine ....	9	8	8	10	9	10	—
8	American Rock Elm .....	16	—	8	16	6	6	—
9	(c) English and French Elm, and Beech .....	16	—	—	16	—	—	—
10	Spruce Fir, Swedish and Norway Red Pine .....	—	—	—	8	8	—	—

(a) That is, two-fifths the depth of hold taken from the top of floors to the top of upper or tonnage deck beams, set up from the keel plate, in midships; which height is not to be exceeded fore and aft on a straight line.

(b) Live Oak, English, French, Adriatic, Italian, Spanish, and Portuguese Oak will be allowed to be used for stems, and for the bow and buttock planks where East India Teak would be liable to break in working, in vessels otherwise built of 16 years' timber material.

(b) Whenever any of the Oaks, or other woods of an acid nature are used, the best Hair Felt, Canvas, or other approved material, in addition to paint, is to be placed between them and the Iron Plates and Angle Irons.

(c) English and French Elm allowed for Garboard Strakes and Planking of flat of bottom in Ships of the 16 years' grade.

Where parties are desirous of using Woods not inserted in the Table, special application to be made to the Committee.



# COMPOSITE VESSELS.

## TABLE K.

Exhibiting the Sizes of Bolts, and Pintles of Rudder.

TONNAGE. (See Section 23).	Deadwood Keel (b) Stem (a) and Stern Post Bolts.	Bottom Plank, Scarphs of Keel, and Thwartship Garboard, Bolts.	Topside, Waterway, and Planksheer Bolts.	Chain Plate Bolts.	Pintles of Rudder.
50 and under 100	$\frac{7}{8}$	$\frac{10}{16}$	$\frac{9}{16}$	$\frac{13}{16}$	2
100 and under 200	1	$\frac{10}{16}$	$\frac{9}{16}$	$\frac{7}{8}$	$2\frac{1}{4}$
200 and under 300	$1\frac{1}{16}$	$\frac{12}{16}$	$\frac{10}{16}$	1	$2\frac{1}{2}$
300 and under 400	$1\frac{1}{16}$	$\frac{12}{16}$	$\frac{10}{16}$	$1\frac{1}{8}$	$2\frac{3}{4}$
400 and under 500	$1\frac{1}{16}$	$\frac{13}{16}$	$\frac{11}{16}$	$1\frac{1}{8}$	3
500 and under 600	$1\frac{1}{8}$	$\frac{13}{16}$	$\frac{11}{16}$	$1\frac{1}{8}$	$3\frac{1}{8}$
600 and under 700	$1\frac{1}{8}$	$\frac{14}{16}$	$\frac{12}{16}$	$1\frac{1}{4}$	$3\frac{1}{4}$
700 and under 800	$1\frac{1}{8}$	$\frac{14}{16}$	$\frac{12}{16}$	$1\frac{1}{4}$	$3\frac{1}{2}$
800 and under 900	$1\frac{3}{16}$	$\frac{15}{16}$	$\frac{13}{16}$	$1\frac{1}{4}$	$3\frac{1}{2}$
900 and under 1000	$1\frac{3}{16}$	$\frac{15}{16}$	$\frac{13}{16}$	$1\frac{3}{8}$	$3\frac{5}{8}$
1000 and under 1200	$1\frac{1}{4}$	1	$\frac{14}{16}$	$1\frac{3}{8}$	$3\frac{5}{8}$
1200 and under 1500	$1\frac{5}{16}$	1	$\frac{14}{16}$	$1\frac{3}{8}$	$3\frac{3}{4}$
1500 and under 2000	$1\frac{6}{16}$	$1\frac{1}{16}$	$\frac{15}{16}$	$1\frac{1}{2}$	$3\frac{7}{8}$
2000 and under 2500	$1\frac{7}{16}$	$1\frac{2}{16}$	1	$1\frac{1}{2}$	4
2500 and under 3000	$1\frac{8}{16}$	$1\frac{2}{16}$	1	$1\frac{5}{8}$	$4\frac{1}{8}$
3000 and under 3500	$1\frac{8}{16}$	$1\frac{3}{16}$	$1\frac{1}{16}$	$1\frac{3}{4}$	$4\frac{1}{8}$

TONS .....	under 150	150 and under 500	500 and under 1000	1000 and under 2000	2000 and under 3000
(See Section 23).					
(a) Number of Bolts in Scarphs of Keels.	6	7	8	9	10

The length of the keel scarphs to be five times the mean of the siding and moulding of the keel.

(a) Stem Scarphs are not to be less than seven-tenths the length of the Keel Scarphs, and all Scarphs are to be Tabled.

BOLTS. 33.—The bolts to be not less than the sizes given in Table, the garboard strakes to be cross-bolted from side to side, with bolts not exceeding four feet six inches apart.

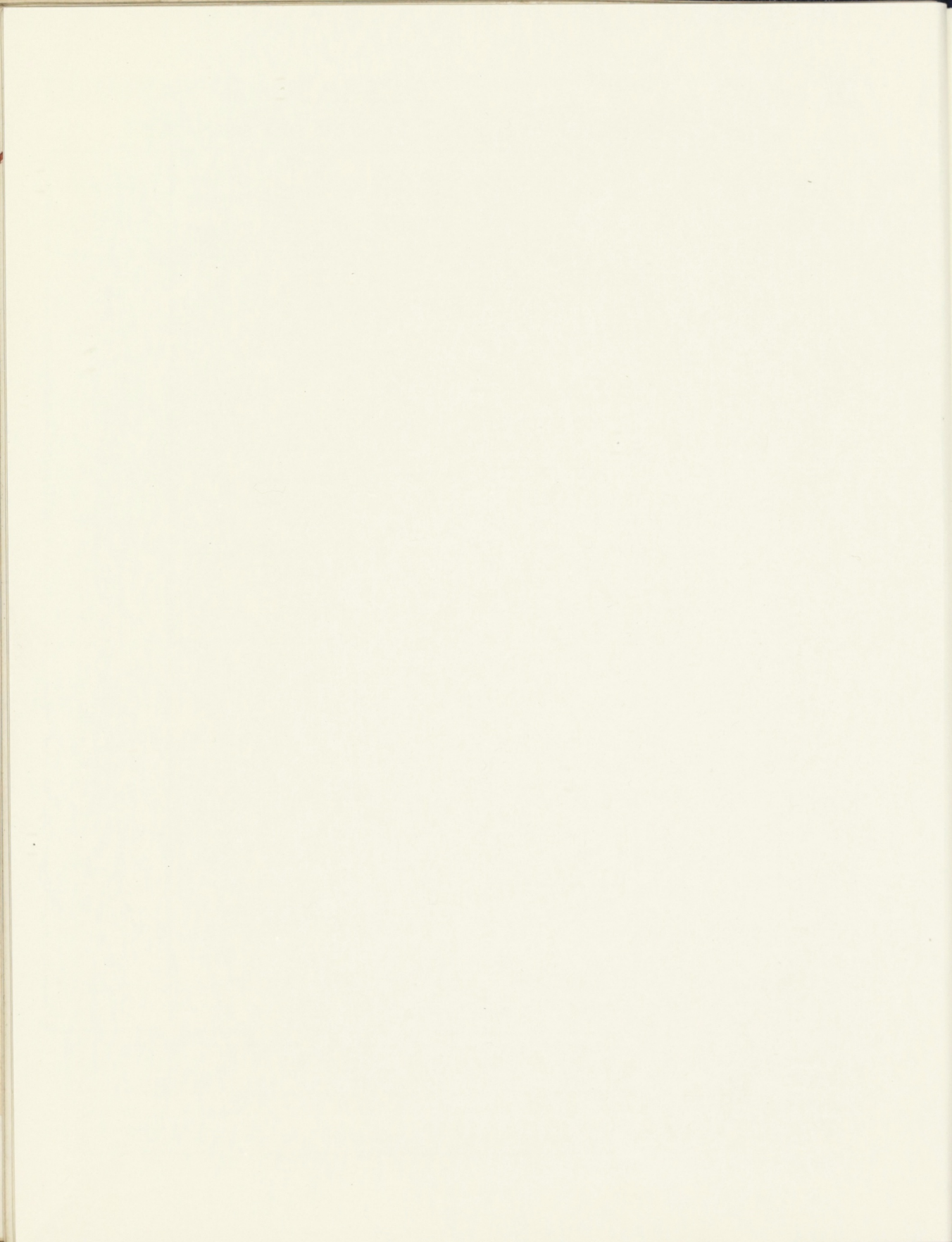
(b) The wood keel to have a vertical bolt through the keel plate between each frame. The stem, stern-post, deadwood, and remainder of the keel, to be through fastened in all cases, and the bolts spaced as in the keel. The screw pointed bolts for fastening the planking when less than five inches thick to be of such form under the heads, as will prevent them from turning, their heads to be once and three-quarters the diameter of the bolts, and two-fifths their diameter in thickness, the nuts in all cases to be of the same description of metal as the bolts they are applied to, and to be in thickness equal to their diameter, and not to have less substance than three-eighths the diameter of the bolts in any part, whatever the form may be, hexagon form being preferred. All outside planks ten inches broad and above, to be double fastened; eight inches-and-a-half and under ten inches, double and single fastened alternately; and under eight inches-and-a-half single fastened; and all butts to be double fastened. The bolt holes in the outside planking to be enlarged with a dowelling machine for the bolt heads, which in the bottom up to within one-fifth the depth of hold set down below the upper deck stringer plate are to be sunk within the surface of the planking one inch and a quarter, when dowels are intended to be used; from thence to the plank-sheer they need not be sunk more than three-quarters of an inch; the bolts to be properly driven with oakum and white lead, putty, marine glue, or other suitable composition under their heads, and in the bottom they are to be carefully covered (after the seams of the bottom are all caulked) with turned well seasoned wood dowels, the fibre of which must be in the same direction as the planking, and be driven with white lead, marine glue, or any other approved composition. Where copper or yellow metal bolts are used, the sinking of them within the surface of the planking to be optional to the above extent.

Lloyd's Register of Shipping, London, 24th February, 1870.























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